CE

KODEN

OPERATION MANUAL

COLOR SOUNDER

CVS-841/851

This product is specifically desingned to be installed on boats and other means of maritime transport. If your country forms part to the EU, please contact your dealer for advice before attempting to install elsewhere.

CVS-841/851.OM.E 0093132682-08

KODEN

Declaration of Conformity

(As required by Article 7 (1) of Directive 89/336/EEC)

Declares under his sole responsibility that the produced Fish Finder manufactured by

Koden Electronics Co., Ltd.
5278 Uenohara, Uenohara-Machi
Kitatsuru-Gun, Yamanashi-Ken
409-0112, Japan

Telephone +81 554 20 5865 **Telefax +81 554 20 5880**

Identified by the type number CVS-841C/841P to which this declaration refers conforms to the requirements of Directive 89/336/EEC amended by 92/31/EEC and 93/68/EEC and is in conformity with the EMC, Health and Safety standards of

EN60945

Signed .....
Saburo Suzuki,

Dated 05 Jan, 2004

Koden Elektronik GmbH.
Am Gewerbepark 15
D-64823, Gross–Umstadt
Germany.
Phone +49 6078 2056
elefax+49 6078 73824

N.B. As this product is for Maritime use compliance with Directive 72/23/EEC is not required.

KODEN

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CVS-841/851 OPERATION MANUAL
Doc No: 0093132682

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2	93132682-02	2004/06/10	Chaper1,2,3,4,8,10 and Chaper5 Contents
3	93132682-03	2004/10/10	Chaper4
4	0093132682-04	2006/03/02	Cover
5	0093132682-05	2006/05/29	Cover Chaper5
6	0093132682-06	2006/08/16	Cover Chaper2
7	0093132682-07	2008/09/22	Declaration
8	0093132682-08	2009/04/16	Chapter 4
9			
10			

Amendment policy

When any change is applied in the document, only the document number of the relevant sheet(s) and cover sheet are modified and the rest of the sheets are not changed. The document number is shown in the footer area, right or left bottom of each sheet.

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Safety Precautions

- **High Voltage**

High voltages are used in the transmitter section which could be life threatening. A protection cover with the words **Danger High Voltage** is provided in this section but wait 10 minutes before inspecting inside. Even if the power switch is turned off, residual voltages may remain in the capacitors inside the unit. Before inspection or replacement of parts, discharge this residual voltage in a safe and correct manner.

- **Disconnect Main Power**

It is still possible to receive an electric shock caused by unintentionally switching on the power during repair work. To prevent this from happening, make sure to completely disconnect the unit from the ship's main supply before attempting any inspection.

- **Dust**

Dust can accumulate inside after long periods of use. Allergies can result from the inhalation of this dust, therefore during inspection and cleaning it is advisable to use a mask.

- **Static Electricity**

Static sensitive semiconductor devices are used in this unit. Before changing the printed boards be careful not to damage any of these devices due to electrostatic build up from carpet, clothes, seats, etc

- **Display Front Plate**

A glass plate is used in front of the Liquid Crystal Display in the CVS-841 sounder unit. The glass is vulnerable against mechanical impact. Use the utmost care when handling this unit, not to apply mechanical shock to this part. In the CVS-851 sounder unit, a plastic plate is used for the same purpose, which is stronger than the glass, however, the same caution should be taken.

- **Liquid Crystal Display**

A Liquid Crystal Display contains mercury, which is harmful to the human body when touched. When you attempt to discard this device, follow the proper disposal procedures.

Symbols used in this manual

The following symbols are used in this manual. You are requested to be fully aware of the meaning of each symbol before carrying out inspection and maintenance of this equipment.

Alarm mark

To handle the equipment ignoring this sign may lead to injury to the human body or damage to the equipment.

Caution mark

To handle the equipment ignoring this sign may lead to a malfunction of the equipment.

Warning High Voltage mark

To handle the equipment ignoring this sign may lead to electrical shock to the human body.

Prohibition mark

This sign indicates that a specified action is prohibited. The prohibited action will be shown in the vicinity of the mark.

How to use this manual

Scope of this manual

This manual contains information about installation, operation and maintenance of the CVS-841/851 series of sounder.

Structure of this manual

This manual is divided into sections according to the contents as described below. This arrangement will help you overview the whole of the contents as well as refer to detailed information for your specific requirement.

Chapter 1: General Information

- General features of the equipment
- Applicable standard
- Equipment configuration
- Software type name

Chapter 2: Equipment Composition

- Standard equipment list
- Spare parts list
- Optional items list
- Available transducers list

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- Functional specifications
- Power supply requirements
- Environmental conditions
- External dimensions and weight

Chapter 4: Installation

- Installation consideration
- Unpacking each component of the system
- Inspection of each component unit and accessories
- Siting the units
- Cable routing and connections
- Display installation

- Inter-connections of the system
- Check up after installation
- Connector’s pinouts
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- Activating the IR function
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- Setting the Alarm Function
- Operating the EVENT key

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- Customize
- Initialize
- Simulator

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- Display mode registration
- Setting the Enhanced effect
- Setting the 3-Division Screen (H/L) and gain

Chapter 8: Trouble Shooting

- Information required for service
- Self check function
- Trouble shooting
- Setting the video threshold

Chapter 9: Maintenance

- Periodic inspection and cleaning

Chapter 10: Technical References

- Serial input data
- Details of input sentences
- Serial output data
- Data input/output serial line
- Data input serial line

Annex Sheets:

- User setting list
- Factory default list

Terminology

Alarming range

A user defined alarming range bar, which is displayed in the right side of the display. When a school of fish or the seabed touches or enters this zone, an audio alarm will be activated.

A scope

Current echo signal is shown in a linear form at the right side of the screen, i.e. signal intensity in the horizontal and depth in the vertical.

Bottom Alarm

The alarm that warns the existence of the sea bottom. The alarm is generated when the sounder has detected the sea bottom within a preset depth.

Bottom Discrimination

Bottom image is zoomed with reference to the seabed. This feature allows an analysis of the sea bottom, in addition to the type of fish school.

Bottom Lock

The sea bottom is always displayed flat with a normal display, which is shown on the upper half of the screen. This allows easy finding of a fish school near the sea bottom and observing the entire sounder image.

Bottom Zoom

The generic term of zoomed sea bottom presentations that includes the Bottom Lock, Bottom Discrimination、and Bottom Zoom.

Color Alarm

An audible alarm function that is triggered when the sounder detects a school of fish in a specific color. The color can be specified by the operator via the menu.

Comparison Mode

A video processing method to discern a weak fish school out of a large mass of fish schools. This mode displays the result of the comparison between HIGH and LOW frequency echoes. If those echoes are overlapped at the same depth, the resultant colors are displayed in mixed colors. However, if the HIGH frequency echo is displayed in red (strongest color), the mixed color will also be red to show the echoes are from small fish. If the mixed fish school is partly displayed with mixed colors among red color, it suggests the possibility of a larger fish school among the small fish school.

Distance Traveled

A logged distance the ship has made. This feature is available only when the speed sensor device is installed.

Draft Line

A sub menu function that adjusts the transducer depth in order to obtain the correct sounding depth in shallow waters.

Dual frequency Mix

A sonar video processing method to detect weak schools of small fish like anchovy, utilizing the sounder's inherent characteristic that small fish are sensitive to high frequency sonar pulses but insensitive to low frequency.

Dual Frequency Normal

A mode of screen presentation in that both high and low frequency images are shown on the screen.

Echo Length Alarm

An audible alarm function that is triggered when the sounder detects a school of fish of a certain length. The length can be specified by the operator via the menu.

Fish Alarm

An audible alarm function that is triggered when a school of fish, which size and color are specified, exists within a predetermined alarming depth range.

Fix Shift

Using this mode, the image starts from a preset depth within a selected range.

Format

The arrangement of the navigational data sentence supplied from an external navigator device.

Gain

The degree of the receiver sensitivity, which can be controlled by the operator's GAIN control (HIGH or LOW).

Gain Control Law

A sub menu function that selects the receiver gain control law. The selectable law is Linear and Log.

Image Speed

The rate of the image feed, which is related to the frequency of the transmission, for instance, 2/1 means the image shifts twice every transmission.

Inner Hull Installation

A method of transducer installation; transducer is installed inside the bottom of the hull using the optional inner hull kit MFB-04.

IR (Interference Rejection)

The name of the operating key switch that allows, when switched in, reducing interference caused by other ship's sounders.

Linear

A gain control characteristic in which receiver gain changes in a linear law (proportional to gain control), which is best suited for shallow water fishing and detection of weak schools of fish.

Log

A gain control law in which receiver gain changes in a log law (steep rise at first then gentle rise), best suited for deep sea fishing.

Navigation Data (B.N)

Navigational data supplied from a navigator unit is shown such as, ship's own position, speed, bearing, waypoints, etc.

Peak Hold

A video processing method, comparing two consecutive sonar video signal in order to output the largest one as the real sonar video.

Pulse Width

The width of the sonar pulse; wider pulse allows better detection of fish school but lack of definition and vice versa.

STC (Sensitivity Time Control)

As the name indicates, the receiver sensitivity is controlled according to the time (depth), to help detection of a school of fish in shallow murky water caused by the existence of plankton or some other forms of marine life.

Simulator

A simulated sonar video image shown on the screen, which is useful to get the hang of the sounder operation before using it in the field.

Sonic Correction

The correction method of a deviated depth display caused by the change of water temperature or salinity.

Subtraction Mode

A video processing method to discern a weak fish school in a mixed image containing a large mass of a fish school. This is done by subtracting LOW frequency video from HIGH frequency video. If the resultant echoes are displayed in similar colors as the HIGH frequency echoes, this result suggests the majority of the fish species is sensitive to HIGH frequency transmission, i.e. the detected fish school could be small fish like young sardine. If the resultant colors are shown in different colors from HIGH frequency transmission, it indicates the fish school is sensitive to LOW frequency, therefore, a larger size of fish species.

Synchronization with External Sounder

This function is used to reduce interference from other sounders operated on the same ship by synchronizing the transmission timing.

Through-hull Installation

A method of transducer installation; transducer is installed on the bottom of the hull.

Upper Depth

The upper limit depth defined in a specific partial zoom mode. If any fish school or the seabed lies in a shallower depth than this depth, it is not detected as a seabed.

VRM (Variable Range Marker)

A movable depth marker shown in a green line, used to measure the depth in higher accuracy.

White Line

The bottom surface is shown in a white band shape. This feature is useful in discerning a school of fish near the seabed.

Zoom Start Depth (Upper depth limit)

The upper depth limit from which partial zooming starts.

Zoom Range

The name of a sub menu, which allows selecting the zooming range of the following image modes; Bottom Lock, Bottom Discrimination and Bottom Zoom.

Main Contents

Chapter 1 General Information

Chapter 2 Equipment Composition

Chapter 3 Specifications

Chapter 4 Installation

Chapter 5 Basic Operation

Chapter 6 Using the Menu

Chapter 7 Functional Registration

Chapter 8 Trouble Shooting

Chapter 9 Maintenance

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Chapter 1 General Information

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Chapter 1 General Information

1.1 General features of the equipment

The CVS-841/851 series sounder is designed to meet stringent demands of the professional fishermen, featuring a 10.4 inch or 15 inch color LCD display, a dual frequency, 1 kW or 3 kW power output. According to the display size and power level the model name is designated as follows:
CVS-841C: The screen size is 10.4 inch (Diagonal) arranged in portrait mode with the 1 kW output.
CVS-851C: The screen size is 15 inch (Diagonal) arranged in landscape mode with the 1 kW output.
CVS-841P: The screen size is 10.4 inch (Diagonal) arranged in portrait mode with the 3 kW output.
CVS-851P: The screen size is 15 inch (Diagonal) arranged in landscape mode with the 3 kW output.

The CVS-841/851 series is composed of a display unit with a built-in TX/RX (Transmitter/Receiver) module and a transducer device. General features of each model are as follows:

Display unit: This unit uses a high brightness, TFT (Thin Film Transistor) Liquid Crystal Display (LCD) to allow easy viewing in daytime and nighttime operations. The screen size and its arrangement of the display unit vary according to the type.

TX/RX module: This module is composed of the transmitter and receiver sections, contained in the display unit. Changing the settings on the printed board of this module can change the transmitting power level and frequency. The output power can be selected from 1 kW (CVS-841C/851C) or 3 KW (CVS-841P/851P) and the frequency from 28 kHz, 38 kHz(or 40 kHz), 50 kHz, 75 kHz or 200 kHz.

All controls of the sounder unit can be performed from the display unit. The operation is simple and straightforward; using dedicated rotary controls and tactile keypads with user-friendly menus. The unit can be set to hands-free operation, where the gain and depth range are automatically selected to an optimized level by a micro-controller chip. The display unit is a splash proof design, meeting IPX5 technical standard.

1.2 Applicable standard

The CVS-841/851 series of sounder is designed and tested to comply with the international standard of IEC-60945 3rd edition that defines general requirements of electronic maritime equipment.

1.3 Equipment configuration

The CVS-841/851 system composition is shown in Table 1.1 (Refer to Figure 1.1 for the system configuration diagram)

Table 1.1 Type names of component units

Model name	Output	Transducer	
CVS-841C CVS-851C	1kW	TD-282	28kHz
		TD-401D	38kHz(or 40 kHz)
		TD-501B	50kHz
		TD-751	75kHz
		TD-2001D	200kHz
CVS-841P CVS-851P	3kW	TD-284	28kHz
		TD-404T	38kHz(or 40 kHz)
		TD-504T	50kHz
		TD-504F	50kHz
		TD-754	75kHz
		TD-66	200kHz

NOTE: The output available from 200 KHz transducer type TD-66 used for CVS-841P/851P is 1 kW.

Dual Frequency TD

Output	Output	Transducer	
CVS-841C CVS-851C	1 kW	TD-501C	50/200 kHz
		TD-501T-3	50/200 kHz

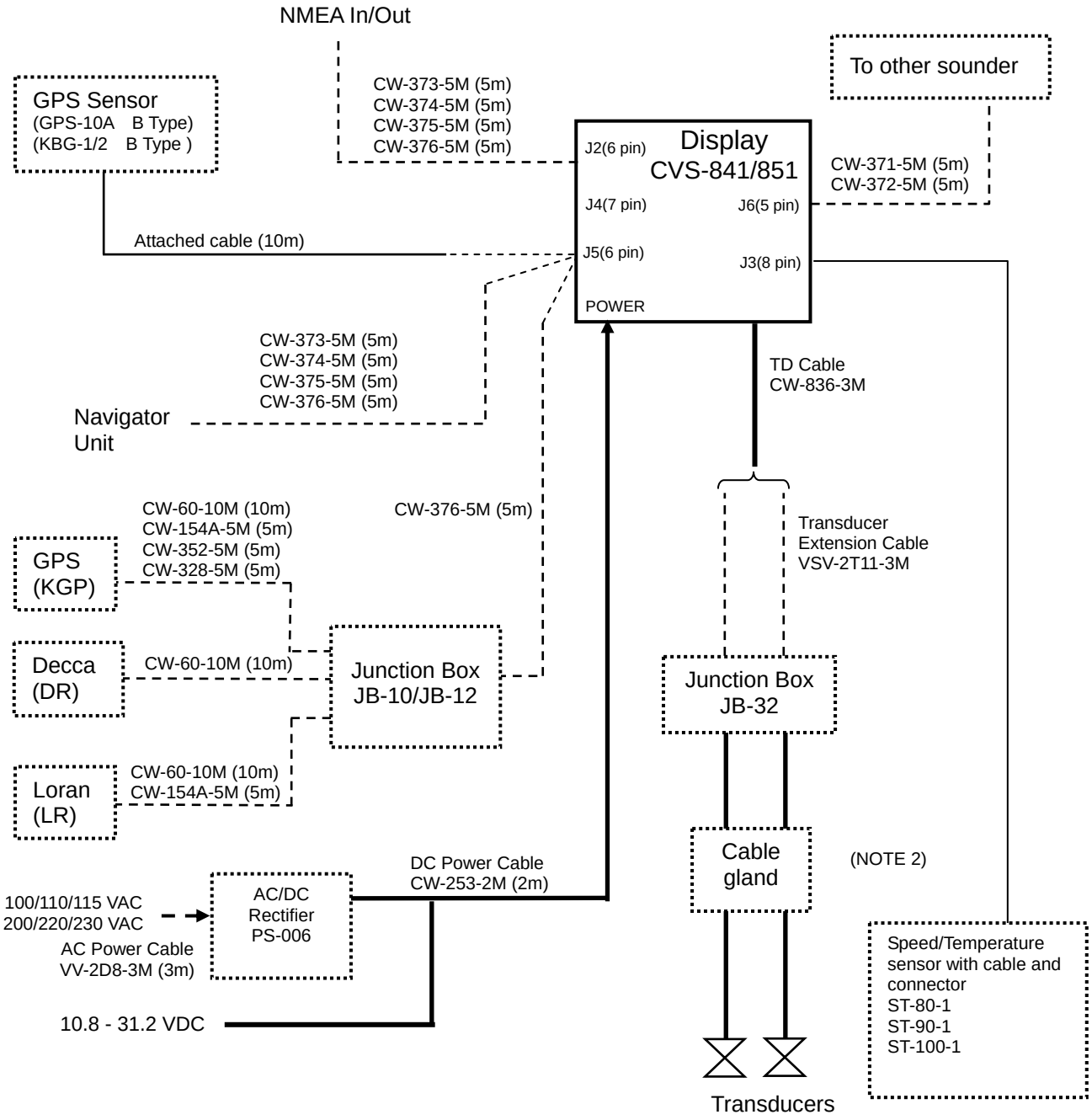
1.4 Software type name

CVS-841:

Software type name	Application
KMC-82	System control

CVS-851:

Software type name	Application
KMC-83	System control



NOTE 1: A section in a dotted block is an optional item.

NOTE 2: The Junction Box JB-32 is available for long cable connections.

Figure 1.1 System configuration of CVS-841/851 series sounder

Chapter 2 Equipment Composition

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Chapter 2 Equipment Composition

2.1 Standard equipment list

No	Item name	Type name	Remarks	Weight/Length	Q'ty
1	Display	CVS-841C/P	With base mount	6.8 kg	1
		CVS-851C/P	With base mount	10.5 kg	
2	DC cable	CW-253-2M	For Display Unit	2m	1
3	TD cable	CW-836-3M	For Transducer	3m	1
4	Spare parts		Detail in Spare Parts List		1 set
5	Operation manual		English		1 set

2.2 Spare parts list

No.	Item name	Type name	Remarks	Weight/Length	Q'ty
1	Fuse	F-7161-10A /N30C-125V	For Display Unit		1

2.3 Optional items list

No.	Item name	Type name	Remarks	Weight/Length
1	Temperature/ speed sensor	ST-80-1	Transom (Plastic, with cable fitted)	0.3Kg
		ST-90-1	Inner hull (Plastic, with cable fitted)	0.6Kg
		ST-100-1	Through hull (Bronze, with cable fitted)	1.2Kg
2	TD Switch	J7-101	Single frequency	1.6kg
		J8-201	Dual frequency	2.2kg
3	Inner hull kit	MFB-04W	Plastic, applicable for 1KW only	1.5kg
4	Kingston kit	MFB-05W	Applicable for 1KW only	0.83kg
5	Junction Box for TD connections	JB-32	For dual frequency	2.0kg
6	Junction Box for Navigator unit connection	JB-10	1 input, 3 outputs × 2 circuits	0.4kg
		JB-12	1 input, 3 outputs, 3 inputs, 1 output	0.42kg
7	AC/DC Rectifier	PS-006	With 2 pcs of 10A fuse attached	8.0kg
8	Extension cable	VV-2D8-3M	Both ends fly leads (For power supply)	3m
		VSV-2T11-3M	Both ends fly leads (For TD)	
9	Earthing lead	OW7/1.6S-3M		3m
10	Connecting cable	CW-371-5M	5P connector /5P waterproof connector (LTW)	5m
	(For external sounder)	CW-372-5M	Fly leads/5P waterproof connector (LTW)	5m
11	Connecting cable (For navigator unit)	CW-373-5M	6P waterproof connector both ends (LTW)	5m
		CW-374-5M	6P connector/6P waterproof connector (LTW)	5m

No.	Item name	Type name	Remarks	Weight/Length
(11)	Connecting cable (For navigator unit)	CW-375-5M	6P waterproof connector (Conxall) /6P waterproof connector (LTW)	5m
		CW-376-5M	Fly leads /6P waterproof connector (LTW)	5m
12	Connecting cable (For Navigator Unit and Junction Box)	CW-60-10M	BNC/Crimp terminal	10m
		CW-154A-5M	6P Connector/Fly leads	5m
		CW-352-5M	6P waterproof connector (Conxall)/Crimp terminals	5m
		CW-328-5M	6P waterproof connector (Conxall) / Crimping terminals	5m
13	Connector female	LTWBD-05BFFA -L180	5P waterproof connector (LTW) for external sounder	
		LTWBD-06BFFA -L180	6P waterproof connector (Conxall) for NMEA0183	
		LTWBD-08BFFA -L180	8P waterproof connector (LTW) for 8water/temperature sensor	
14	Cable gland	CG-1	For steel hull, single frequency	1.5Kg
		CG-2	For steel hull, dual frequency	1.5Kg
		CG-3	For wooden hull, single frequency	2.5Kg
		CG-4	For wooden hull, dual frequency	3.5Kg
		CG-16	For FRP hull, single frequency	0.9Kg
		CG-18	For FRP hull, dual frequency	1.8Kg
		CG-19	For wooden/FRP hull, single frequency	1.0Kg
15	Operation manual	CVS-841/851.OM.J	Japanese	
		CVS-841/851.OM.E	English	
16	Service manual	CVS-841/851.SM.J	Japanese	
		CVS-841/851.SM.E	English	
17	transducer	See 2.4 Available transducer list.		

2.4 Available transducers list

Single Frequency TD

Output	Type name	Frequency	Weight
1 kW	TD-282	28 kHz	7.0 kg
	TD-401D	38 kHz(or 40 kHz)	5.0 kg
	TD-501B	50 kHz	4.2 kg
	TD-751	75 kHz	4.2 kg
	TD-2001D	200 kHz	4.2 kg
3 kW	TD-284	28 kHz	11.0 kg
	TD-404T	38 kHz(or 40 kHz)	11.0 kg
	TD-504T	50 kHz	11.0 kg
	TD-504F	50kHz	10.0kg
	TD-754	75 kHz	6.5 kg
	TD-66 (See NOTE)	200 kHz	4.2 kg

NOTE: The effective power output available from the 3 kW/200 KHz transducers is 1 kW.

Dual Frequency TD

Output	Type name	Frequency	Weight
1 kW	TD-501C	50/200 kHz	4.2 kg
	TD-501T-3	50/200 kHz	3.4 kg

Chapter 3 Specifications

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3.3 Environmental conditions..... 3-3

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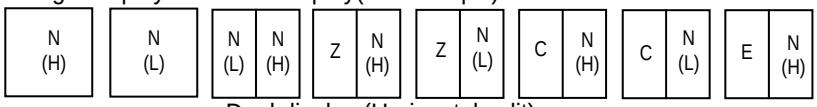
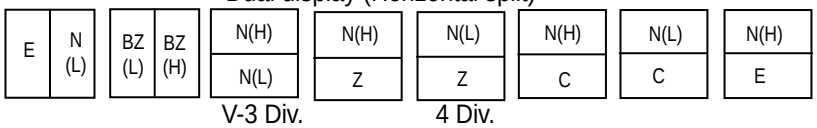
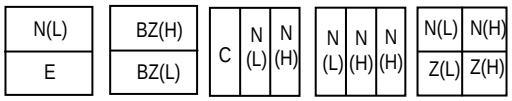
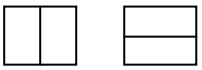
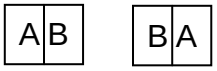
Chapter 3 Specifications

3.1 Functional specifications

Specifications are subject to change without notice.

Equipment type name	CVS-841C(1kW), CVS-841P(3kW) CVS-851C(1kW), CVS-851P(3kW)
Display	CVS-841: 10.4 inch color TFT LCD (480 × 640 dots) CVS-851: 15 inch color TFT LCD (640 × 480 dots)
Display color	16 colors (Color pallet can be changed)/background: 9 colors
TX Frequency(kHz)	Dual, combination selected from 28, 40(or 38), 50, 75, 200kHz
Sounding range	Depth Unit: meter/hiro/fathom/Italian fathom. Auto Range or 8 range scales are selected from the following scaling group. For 1 kW/3 kW: 2.5-10(2.5 step), 10-100(5 step), 100-400(10 step), 400-1000(50 step), 1000-1200(100 step) For 3 kW only: 1200-3000(100 step)
	Depth Unit: feet Auto Range or 8 range scales are selected from the following scaling group. For 1 kW/3 kW: 10-20(5 step), 20-80(10 step), 80-400(20 step), 400-1600(40 step), 1600-4000(200 step) For 3 kW only: 4000-7200(200 step), 7200-8000(400 step)
Zoom/Bottom Range	Depth Unit: meter/hiro/fathom/Italian fathom. One range selected. 2.5, 5, 7.5,10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 180, 200
	Depth Unit: feet One range selected. 10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 320, 360, 400, 450, 500, 550, 600, 650
Shift	Automatic/Manual Unit: meter, hiro, fathom, Italian fathom Deepest depth: 3000(1kW)/3000(3kW) (1 step depth increment) Unit: feet Deepest depth: 8000(1kW)/8000(3kW) (1 step depth increment)
Picture Mode N: Normal(incl. SHIFT) (H): High frequency (L): Low frequency Z: Zoom (Bottom Lock, Bottom Discrimination, Bottom Zoom B.Z: Bottom Zoom C: Combined E: Enhanced A: A Scope	Single display Dual display(Vertical split)  Dual display (Horizontal split)  V-3 Div. 4 Div.  A-scope (except the combined picture) display can be added to the above display mode except the C (Combined) display.

Display area in ratio	Horizontal split: 1:1 Vertical split: 1:1 Vertical split to 3 divisions: 1:1:1 4 divisions (V/H divided by 2) : 1:1:1:1 NOTE:Zoomed Horizontal split division rstio approx 2:1
Interference rejection	3 steps (Off, 1, 2)
Color rejection	15 steps (one out of 15 colors)
Alarm	Fish alarm, Depth alarm
Image speed	Fixed 12 speed (4/1, 3/1, 2/1, 1/1, 1/2, 1/3, 1/4, 1/6, 1/8, 1/12, 1/16, 1/32) and stop
Output reduction	2 steps (Standard and reduced)
Pulse width	4 steps (Very narrow, Narrow, Middle, Wide)
Color tone	3 steps (1,2,3)
Background color	9 steps (1,2,3,4,5,6,7,8,9)
Image mix type	3 steps (A, B, C)
Digital depth display	4 steps (Off, Large, Middle, Small)
Digital depth display position	2 ways (Up or Down)
Depth scale display	3 ways (Off, One, All)
Scale position	2 ways (Edge or Center)
Scale numeral display	2 ways (Large or Small)
Time mark	3 ways (Off, 10 sec, 1 min)
Image feed direction	3 ways (←|←, ←|→, →|→)
Image split	
Image swap	
Water temperature	3 ways (Off, °C, °F)
Auto function	Depth range, shift
Clock function	Year, Month, Day, Hour, Minute, Second (NOTE: CVS-841 has no Year, Month, Day, a Day of the Week displays.
Depth unit	5 kinds (m, hiro, fm, I.fm, ft)
Bottom detection range	2 ways (Within or outside the sonar display)
Depth sounding	3 ways (Auto, High frequency, Low frequency)
Marker	Variable range marker (VRM), Scale, Guard zoom marker, Division marker, Time marker, Color pattern
Rotary controls	Brilliance, Gain, Enhancement, STC, Depth range, Image mode
Other functions	Enhance, White line, Flicker reduction, A scope, Information window(CVS-841 is not displyed), Temperature graph, Mark (Position, Distance, Bearing, Elapsed time), Draft, Bottom detection start position, Sonic correction, Temperature correction, Speed correction, Int/Ext sync switching, PRF, GAIN law、STC law, Color change, Key switch lock
Navigation data	Ship's position (lat/Lon every 0.001 Min, Loran C LOP), Water temperature (°C, °F, Graph display), Ship's speed (km/h,mph,kt), Distance traveled (km,sm,nm), Owh ship's bearing
Input data format	NMEA-0183 Ver2.0/1.5(GGA,GLL,GTD,MTW, RMC,VTG) or NMEA-0182
Output data format	NMEA-0183 Ver2.0/1.5 (DBS,DBT,DPT,MTW,TLL)

3.2 Power supply requirements

DC operation

Input voltage: 10.8 - 31.2 VDC

Input power: CVS-841: 45 W Max CVS-851: 70W Max

AC operation

An AC/DC rectifier PS-006 must be used.

Input voltage range: 100/110 VAC or 220/230 VAC
Voltage fluctuation allowance: +/- 10%
Frequency fluctuation allowance: 47 - 63 Hz
Input power: 150 W

3.3 Environmental conditions

(1) Temperature and humidity

Operation temperature: -15°C to +55°C

Storage temperature: -30°C to +70°C

Humidity: 93 +/- 3 % @+40°C

(2) Vibration

The units are free from any functional deterioration or mechanical damage caused by the vibrating conditions stated below:

2 - 5 Hz up to 13.2 Hz: Amplitude +/- 1mm +/- 10% (Maximum acceleration of 7 m/s^2 at 13.2 Hz)

(3) Water proof characteristic

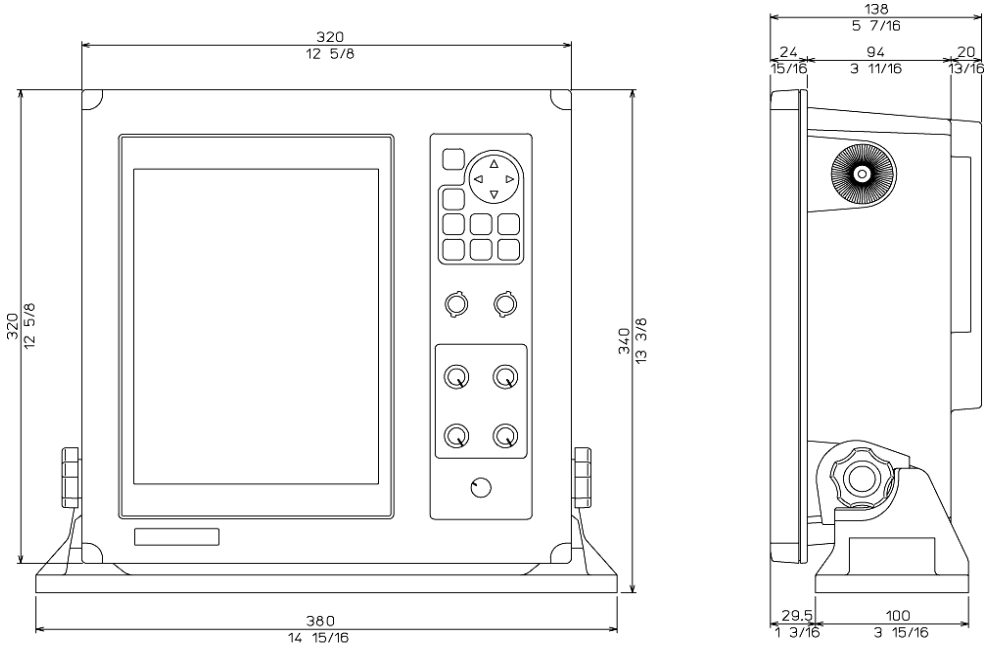
Display: IPX5 (Water jet proof)

3.4 External dimensions and weight

External dimensions: Width x Hight x Depth

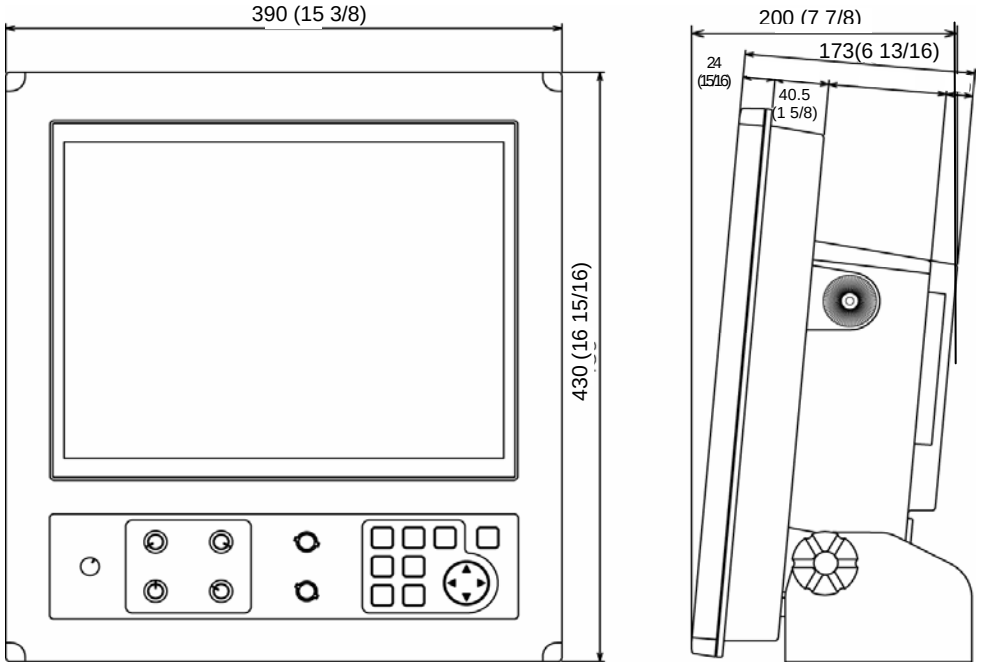
CVS-841: 320 (12 5/8) x 340 (13 3/8) x 138 (5 7/16) mm (inch), 6.8 kg (15 lbs)

CVS-851: 390 (15 3/8) x 430 (16 15/16) x 173 (6 13/16) mm, 10.5 kg (23.0 lbs)



Unit in mm (inch)
Weight: 6.8 kg (15 lb)

Figure 3.1 External dimension of CVS-841 Display unit



Unit in mm (inch)
Weight: 10.5 kg (23.0 lb)

Figure 3.2 External dimensions of CVS-851 Display Unit

Chapter 4 Installation

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Chapter 4 Installation

4.1 Installation consideration

General

Qualified service technicians should perform the installation of CVS-841/851 series that comprises the following operations.

(1) Unpacking each component of the system.
(2) Inspection of the exterior of each component unit and accessory.
(3) Checking the ship's mains voltage and current capacity.
(4) Determining the installation site
(5) Installing the Display unit
(6) Planning the cable routing and connections
(7) Adjustment and setups

4.2 Unpacking each component of the system

Unpack your package and check if all of the items stated in the packing list are contained in the package. If not, report this to an insurance agent for tracing missing goods or refund.

4.3 Inspection of each component unit and accessories

Carefully check the exterior of each component unit for dents, damage, etc. Also check the inside of component units for electrical and mechanical damages, for instance, the LCD backlighting bulb is vulnerable against mechanical shock.

4.4 Siting the units

To achieve best operational performance, the following factors must be considered.

(1) The display unit should be positioned in the location where the external situation can be viewed.
(2) Locate the display so that it provides easy viewing from all likely operator's positions.
(3) Select a position safe and free from dampness, water spray, rain and direct sunlight.
(4) Provide enough space for servicing. Consider access to the rear panel for connecting various cables.
(5) Position the display unit as possible away from other radio equipment.

4.5 Cable routing and connections

(1) The transducer cables should be securely fastened to the TX/RX chassis using strain relief cable clamps and run separately away from other cables such as, radio antenna feeders, power cables, etc. Under no circumstances should it be in parallel arrangement with other cables. These precautions are essential to avoid radio interference to/from other equipment installed on the ship. If this arrangement is not possible, either cable set should be screened with a metal conduit or

another form of shielding.

(2) The display unit should be grounded to the hull as short as possible. We recommend using a wide and heavy copper braid or plate to be connected to a grounding stud at the rear of the display unit.

(3) The power supply cable should be connected directly to the ship's battery to avoid RF noise conducted from other equipment on board.

4.6 Display Installation

The display unit is designed for table mount and flush mount. Refer to the following descriptions for installation. (See Figure 4.1 to 4.7)

4.6.1 Table mounting

(1) Remove the two knurled fixing knobs that fix the display unit to the mounting bracket.

(2) Remove the display unit from the bracket and place it on a flat and safe area.

(3) Place the mounting bracket to the place where the display unit is to be installed, and fix the bracket with four (4) tapping screws. It is recommended to keep sufficient space for maintenance services at the position of installation. (See Figures 4.2 and 4.4).

(4) Install the display unit on to the mounting bracket and fix the unit with two knob bolts removed at the above (1). Refer to the following figures for detail.

[CVS-841]

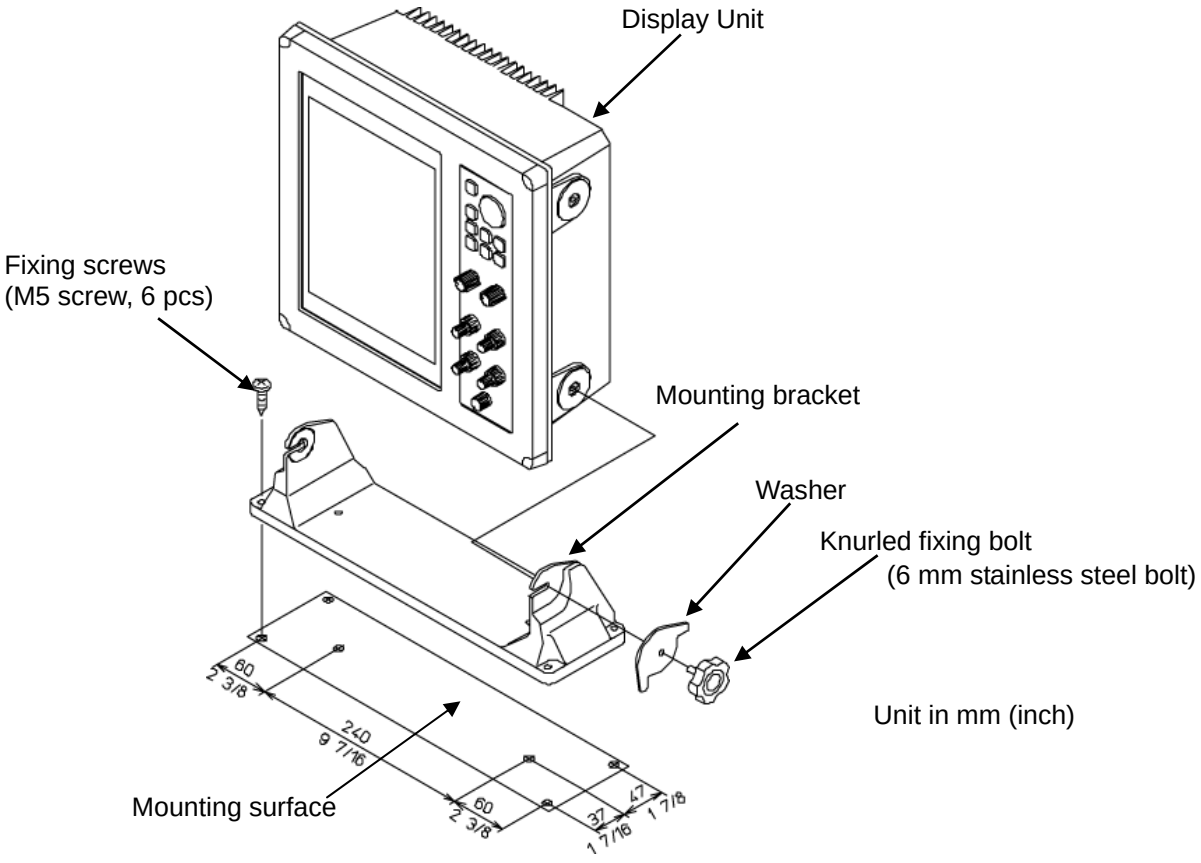
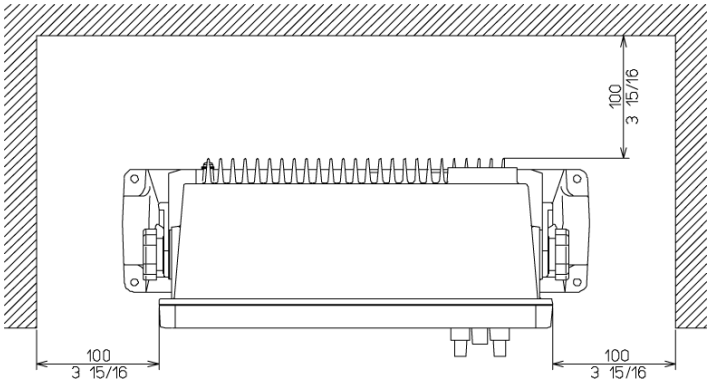


Figure 4.1 Fitting detail of CVS-841



Unit in mm (inch)

Figure 4.2 Service space required for CVS-841

[CVS-851]

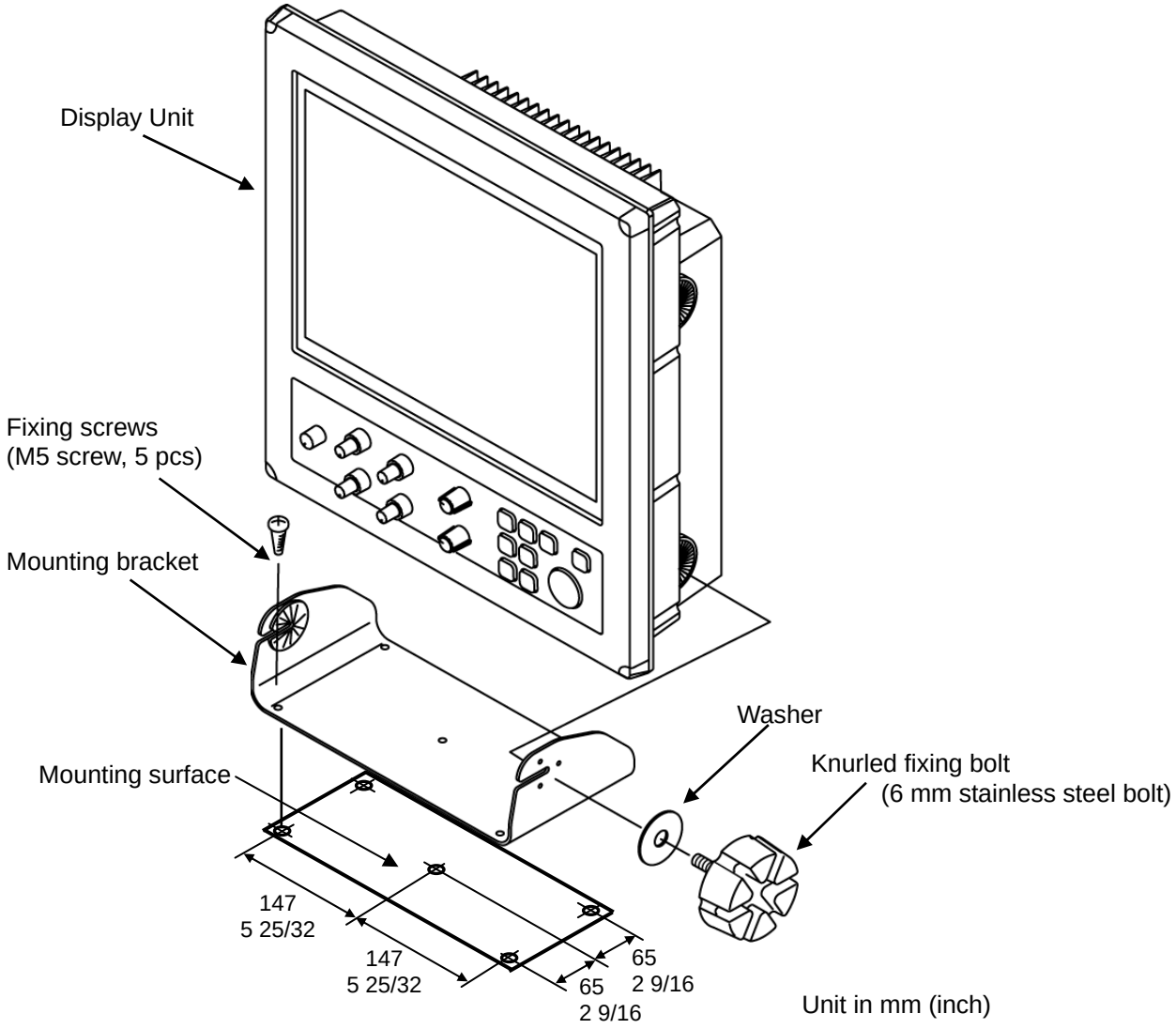
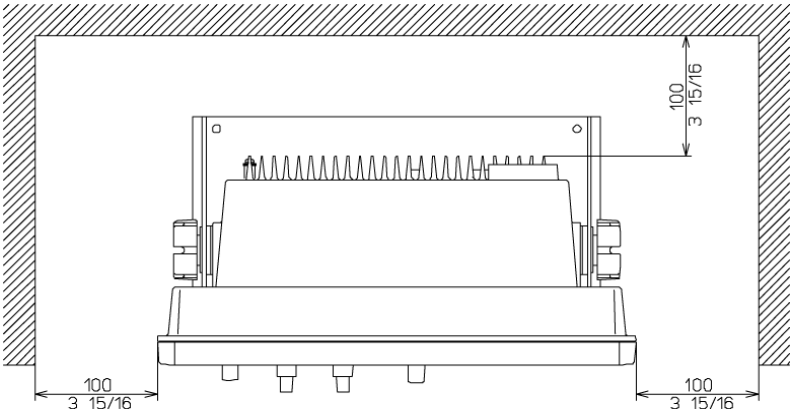


Figure 4.3 Fitting detail of CVS-851



Unit in mm (inch)

Figure 4.4 Service space required for CVS-851

4.6.2 Flush mounting

(1) Cut a rectangle opening that Figure 4.6 or Figure 4.7 is followed.

(2) Loosen two (2) fixing knobs that fasten the display unit onto the mounting bracket.

(3) Remove four (4) plastic screw covers, which are fitted on each corner of the display front face. (These can be removed easily by pulling upward.)

(4) Put the display on the opening and fix with four (4) tapping screws. In case you use M4 screws to fix the display, select an appropriate screw length that best suits fixing the unit to the panel thickness.

(5) Refit the coverings removed in step (3).

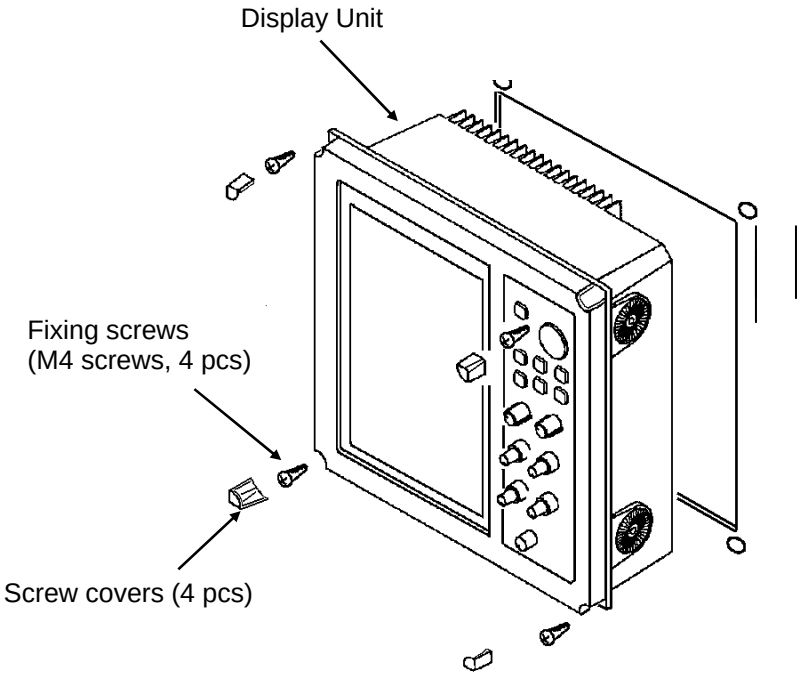


Figure 4.5 Fitting the Display Unit in flash mount mode (CVS-841)

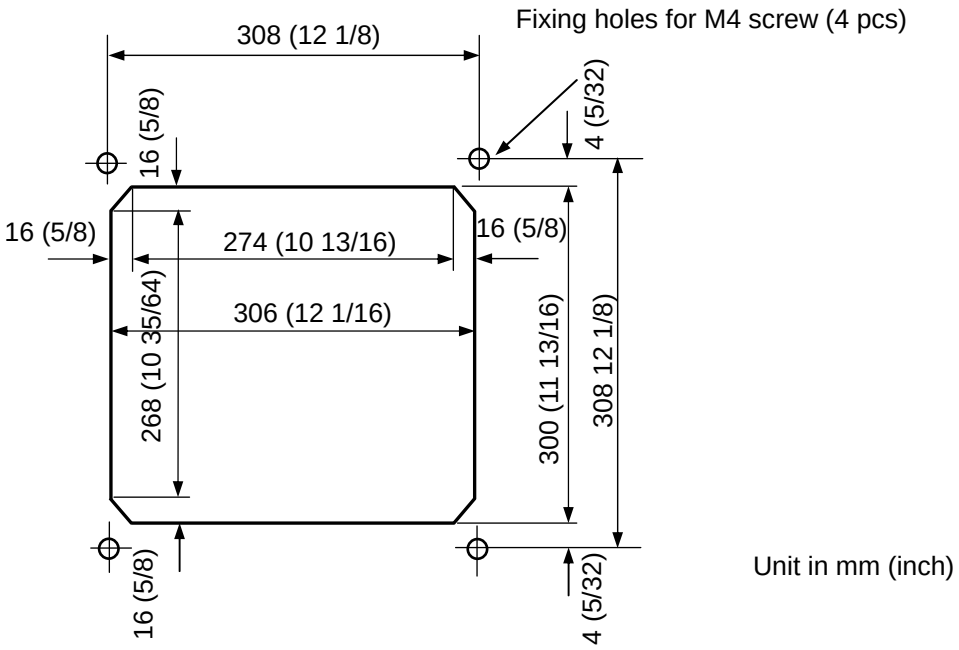


Figure 4.6 Dimensions of opening and fixing holes for CVS-841

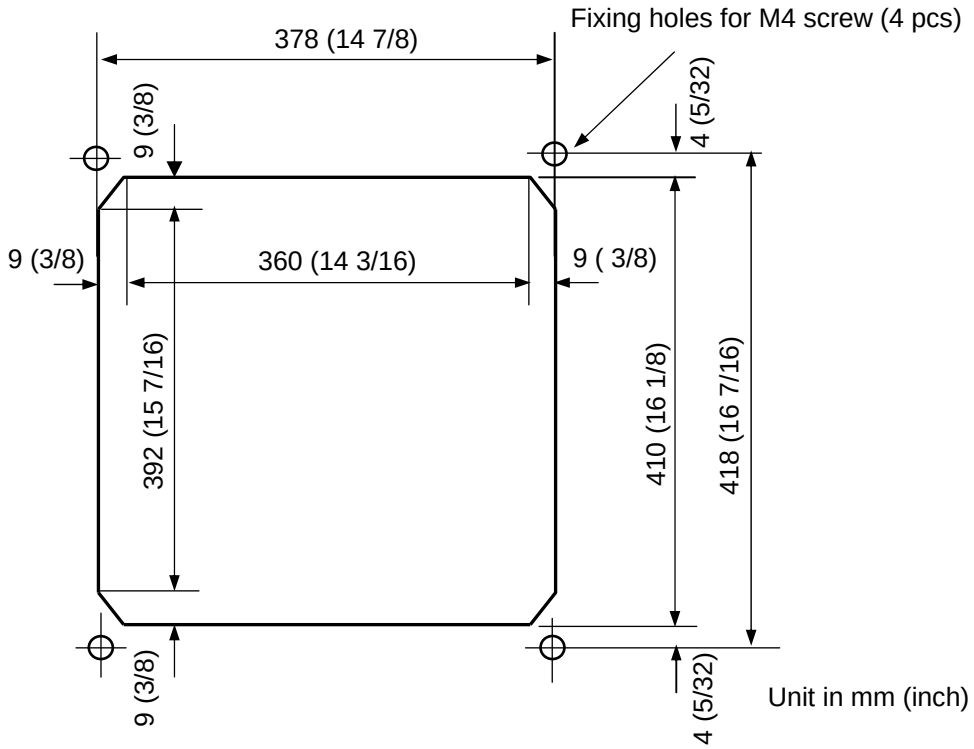


Figure 4.7 Dimensions of opening and fixing holes for CVS-851

4.7 Inter-connections of the system

As shown in Figure 4.8, TD cable and DC power cable shall be connected to the given connectors provided on the rear panel of Display Unit.

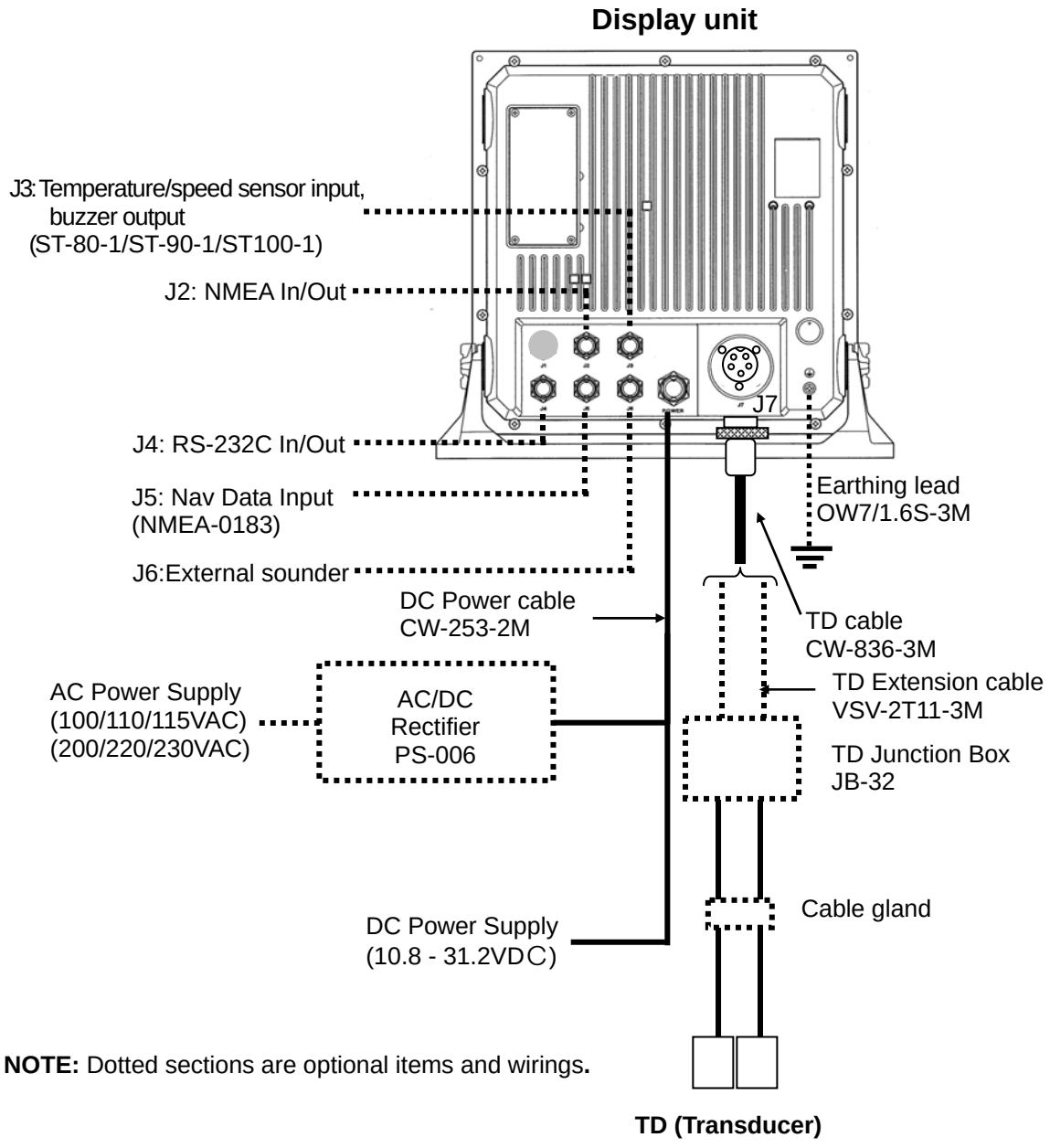
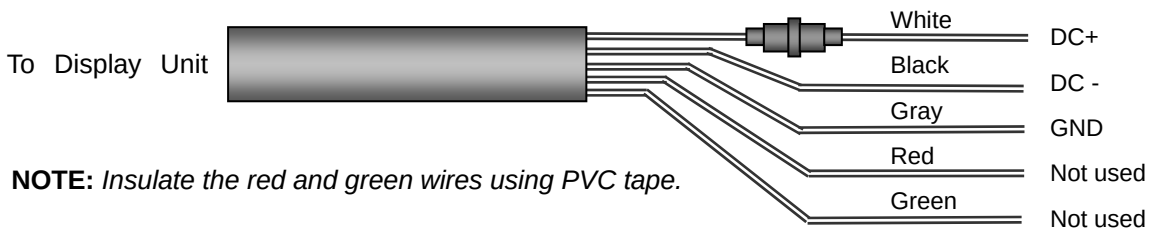


Figure 4.8 Inter-connections of CVS-841/CVS-851

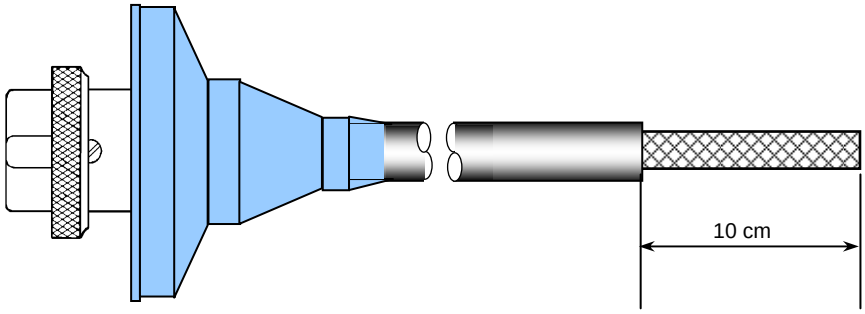
4.7.1 Connection of DC Power cable (CW-253)



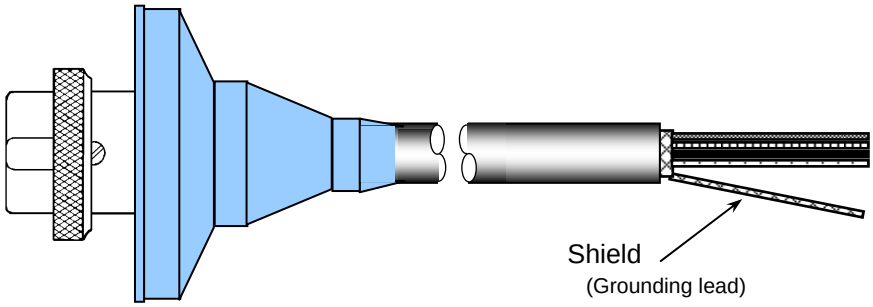
NOTE: *Insulate the red and green wires using PVC tape.*

4.7.2 Preparation of TD cable

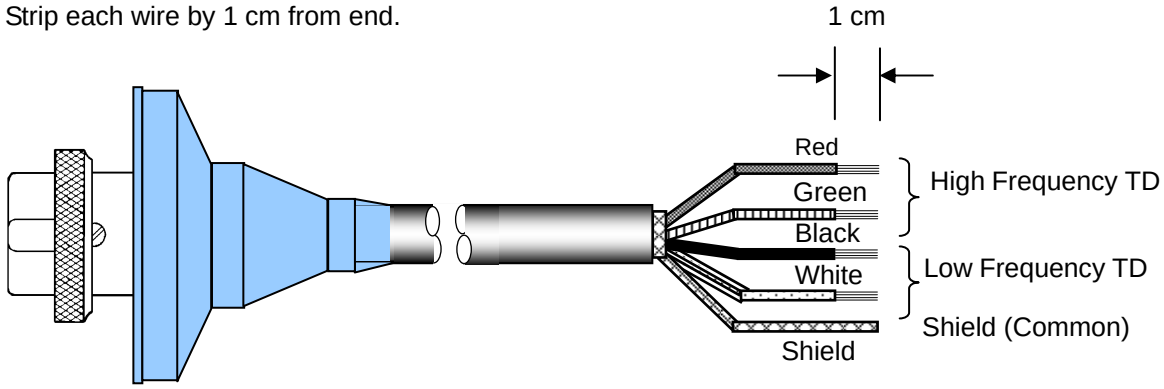
(1) Cut off the terminal sheath of the attached TD cable (CW-836-3M) by 10 cm from end.



(2) Separate the braid from the strand and twist it to form a grounding lead.



(3) Strip each wire by 1 cm from end.



(4) Connect the TD cable (CW-836-3M) to the receptacle J7 at the display rear panel and press the rubber jacket onto the connector body to secure water tightness.

4.7.3 Connections of the transducers

Depending on the transducer type, the connections are different. Refer to the connecting diagram below. Also note for the connections. If the Transducer Junction Box is used, connect each lead to a designated terminal, and if the junction box is not used, solder two leads with PVC tape wound appropriately for good isolation.

4.7.3.1 About TD cable

The cable from TD has black and white core wires with covering shielding copper braid.
The high frequency side of TD shall be connected to red and greed core wires, and the low frequency side shall be connected to black and white core wires.
The shield wire shall be connected to the shield wires of low and high frequency sides.

Note 1: The cable for TD type TD-2001D (200 kHz, 1 kW) has four colors core wires (red, white, green and black). In this case, red and white shall be connected to the red core wire of TD cable (CW-836-3M), and green and black to the green of TD cable (CW-836-3M), respectively.

Note 2: TD type TD-501C operates at 50/200 kHz with one TD, and has black and white two core wires. The white core shall be connected to the white core of TD cable (CW-836-3M), and the black core to the black core of the TD cable,(CW-836-3M) respectively.
The red and green core wires will not be used and shall be insulated.

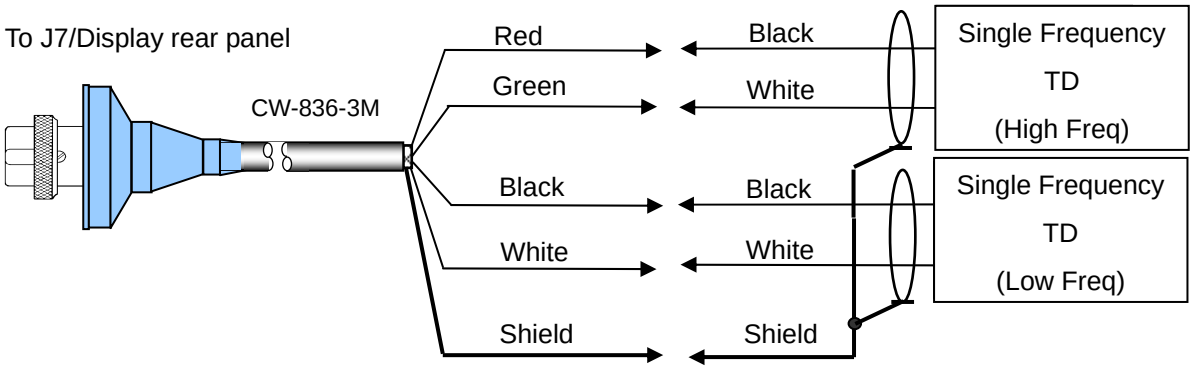
Note 3: TD type TS-501T-3 operates at 50/200 kHz with one TD and is provided with a water temperature sensor. There are four core wires of white, black, red and green.
The core wires for transmission and receiving are white and black core wires, and green and red are for the water temperature sensor.
The white core shall be connected to the white core of TD cable (CW-836-3M), and the black core to the black core of the TD cable (CW-836-3M), respectively.
The red and green core wires of the TD cable will not be used and shall be insulated.

4.7.3.2 Connecting the TD cable

(1) In the case that CVS-841/851 are the specification of standard 2 frequencies

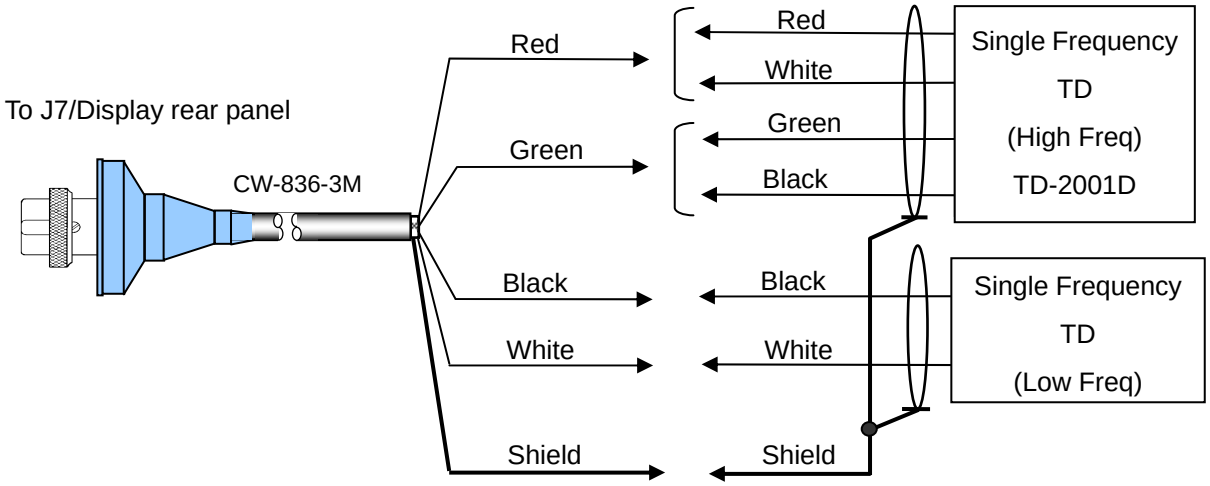
Example 1. [Single Frequency TD except TD-2001D]

The display unit and the transducer cables are connected on 1:1 basis, as follows. Solder the cables and apply winds of PVC tape to make sure of good isolation between the cables.



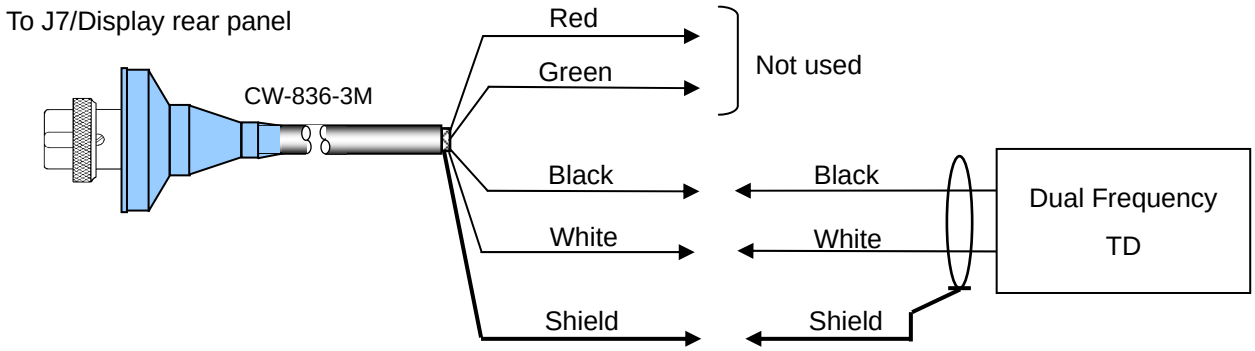
Example 2. [Single Frequency TD, TD-2001D]

The display unit and the transducer cables are connected as follows:



Example 3. [Connections of Dual Frequency TD（TD-501C/TD-501T-3）]

The TD-501C and 501T-3 are of a Dual Frequency TD in which the 50 kHz and 200 kHz transducer elements are encapsulated in a single housing. The display unit and the transducer cables are connected on 1:1 basis, black to black and white to white. The red and green cores of TD-501T-3 will not be connected to CW-836-3M (see the figure below).



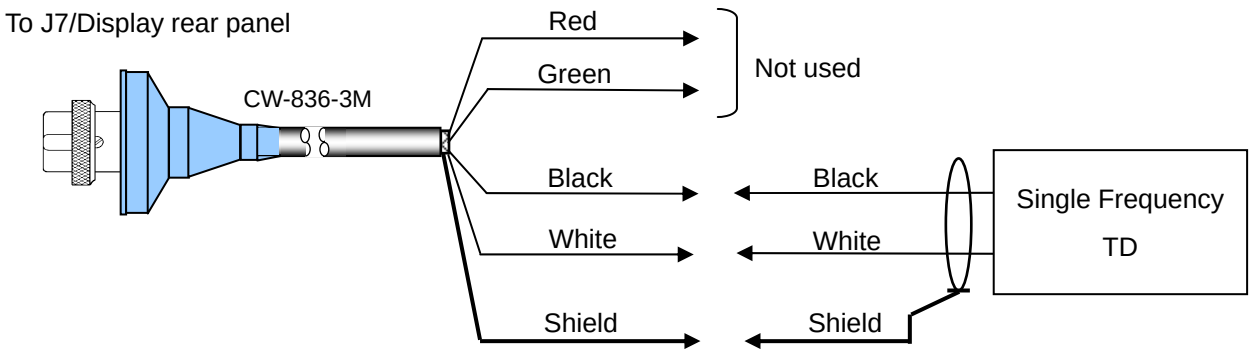
(2) In the case that CVS-841/851 are the specification of a special 1 frequency

Caution:

To modify to single frequency specification, special setup will be required. Please contact us if it is desired.

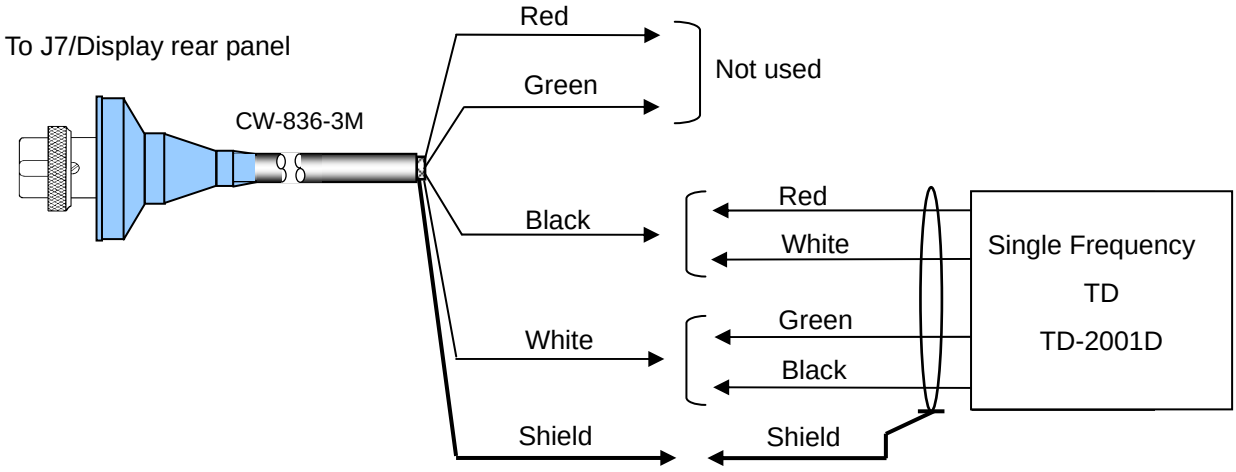
Example 1. In case of Single Frequency TD, (except TD-2001D)

The cables between the display unit and the transducer shall be connected at 1:1 basis at low frequency side (see the figure below).



Example 2. In case of TD-2001D

The cables between display unit and the transducer shall be connected at low frequency side as follows (see the figure below).



4.8 Check up after installation

Before you turn the unit on, check the following points to make sure the CVS-841/851 operates properly.

(1) Is the ship's supply voltage and current within the rated range?

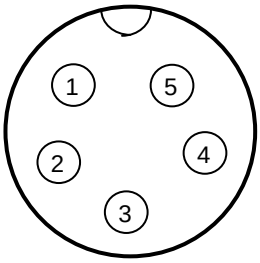
(2) Is the transducer wiring normal? No wrong connections, no short circuits, etc?

(3) Are the High and Low frequency transducers properly connected to their corresponding terminals?

(4) Are the cables routed and connected properly according to Para. 4.5 "Cable routing and connections"?

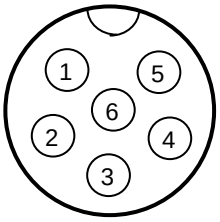
Appendix 1
Connectors' pinouts

Transducers
J7



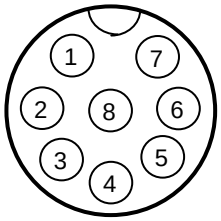
1. TD (TD1H:High Frequency)
2. TD (TD1L:Low Frequency)
3. SH (Shield)
4. TD (TD2H:High Frequency)
5. TD (TD2L:Low Frequency)

NMEA In/Out
J2



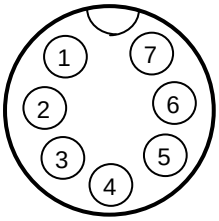
1. Ground (GND)
2. Serial Output (TX)
3. Serial Output (GND)
4. Serial Input + (RX+)
5. Serial Input – (RX-)
6. Not used (NC)

Water temperature/Speed Sensor Inputs and Buzzer Output
J3



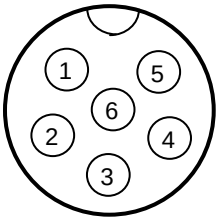
1. Speed Pulse Input (SPD.PULSE)
2. Speed +B (SPD.VCC)
3. Buzzer Output 0 (BUZ0)
4. Buzzer Output 1 (BUZ1)
5. NC
6. Water Temp +B (TEMP.VCC)
7. Water Temp Signal In (TEMP.SIG)
8. Speed GND (SPD.GND)

RS232C In/Out
J4



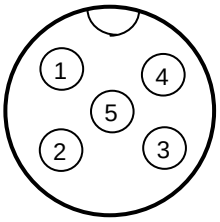
1. RS232C Data Input (RXD)
2. RS232C Data Output (TXD)
3. +5V (+5v)
4. Ground (GND)
5. Not used (NC)
6. EVT (EVT): Not used
7. Ground (GND)

NMEA Nav Data Input
J5



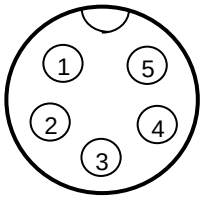
1. Ground (GND)
2. GPS Signal Out (GPS OUT): Not used
3. Ground (GND)
4. Nav Data In + (GPS IN+)
5. Nav Data In – (GPS IN-)
6. +12V (+12V)

External Sounder Input
J6



1. Ext Trig In (EXT.TRG)
2. Ground (GND)
3. 0.Trig Out (0.TRIG OUT)
4. AF Signal Out (AF.SIG.OUT)
5. Not used (NC)

DC Input (10.8 - 31.2VDC)
POWER

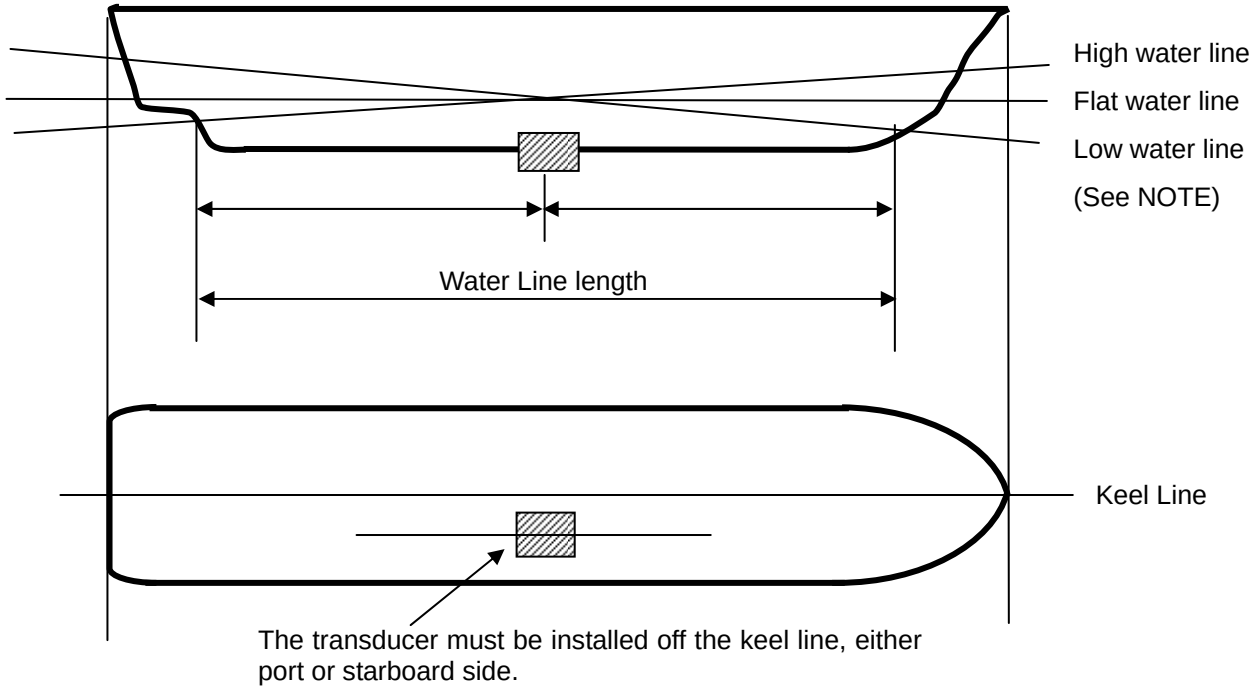


1. DC –
2. DC +
3. NC
4. NC
5. Frame Ground

Appendix 2
Transducer installation

A2-1. Recommended transducer installation

The transducer should be installed in a location free of bubbles and away from disturbed water flow. Smooth water flow around the transducer and along its surface is very important for consistent operation. Areas in the center of water line length at cruising speed are usually satisfactory. Forward of the engine and in a flat area near the centerline of the boat are preferred. Do not install the transducer behind water intakes, other through-hull fittings or irregularities in the hull.


High water line
Flat water line
Low water line
(See NOTE)
Water Line length
Keel Line
The transducer must be installed off the keel line, either port or starboard side.

NOTE:

High water line: Water line when vessel pitches up most.

Low water line: Water line when vessel pitches down most.

Figure A.1 Recommended position of the transducer

A2-2. Through-hull installation

Transducer installation of CVS-841/851 is only possible with through-hull installation. Various types of rectifying tanks (Turbulence Minimizing Enclosure) are prepared according to the material of the ship's hull or transducer frequency used. Mount the rectifying tank to the ship's bottom before mounting the transducer to in the rectifying tank. The more the tank protrudes, the less the water turbulence. The following drawing illustrates an example of the through-hull installation.

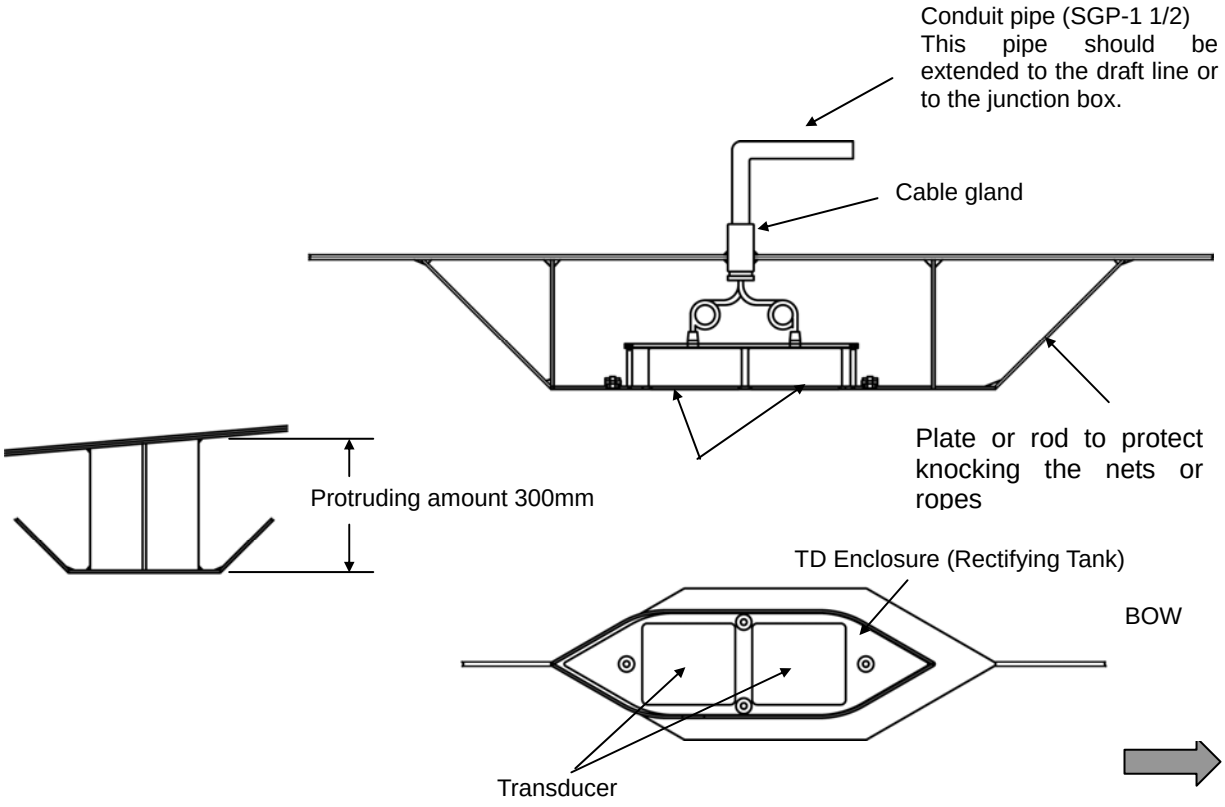

Conduit pipe (SGP-1 1/2)
This pipe should be extended to the draft line or to the junction box.
Cable gland
Plate or rod to protect knocking the nets or ropes
Protruding amount 300mm
TD Enclosure (Rectifying Tank)
BOW
Transducer

Figure A.2 An example of the through-hull transducer installation

Chapter 5 Basic Operation

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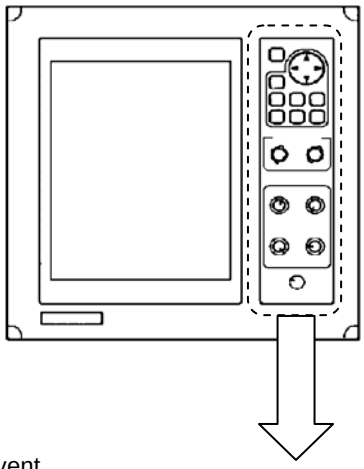
Chapter 5 Basic Operation

5.1 Operating controls and functions

5.1.1 Operating controls and key switches

[CVS-841]



Enlarged

EVENT key
Registers or updates the event.

MENU key
Turns on or off the menu display.

SHIFT key
Turns on or off the image shift mode

VRM key
Turns on or off VRM. It also selects the VRM mode.

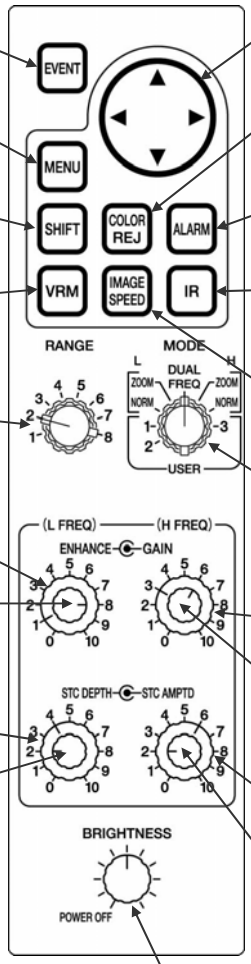
RANGE switch
Selects the depth range.

L FREQ ENHANCE control
Varies the degree of enhance effect for Low Frequency image.

L FREQ GAIN control
Varies the receiver gain of Low Frequency image.

L FREQ STC DEPTH control
Varies the effective range of Low Frequency STC in depth

L FREQ STC AMPTD control
Varies the intensity of Low Frequency STC.



Four way arrow key
Selects or sets up the menu items, etc.

COLOR REJ key
Selects the setting of Color Rejection function.

ALARM key
Turns on or off the Alarm. This key is also used to select the alarm setting.

IR key
Turns on or off the IR (Interference Reject) effect. This key is also used to select the IR setting.

IMAGE SPEED key
Selects the image speed

MODE switch
Selects the image mode.

H FREQ ENHANCE control
Varies the degree of enhance effect for High Frequency image.

H FREQ GAIN control
Varies the receiver gain of High Frequency image.

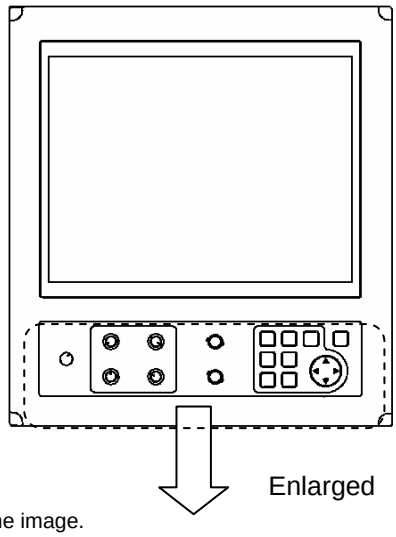
H FREQ STC DEPTH control
Varies the effective range of High Frequency STC in depth.

H FREQ STC AMPD control
Varies the intensity of High Frequency STC.

POWER/BRIGHTNESS control with a switch
Turns on or off the unit and adjusts the brightness of the image.

Figure 5.1 CVS-841: Details of operating key switches

[CVS-851]



Enlarged

POWER/BRIGHTNESS control with a switch
Turns on or off the unit and adjusts the brightness of the image.

H FREQ STC DEPTH control
Varies the effective range of High Frequency STC in depth

H FREQ STC AMPTD control
Varies the intensity of High Frequency STC.

H FREQ ENHANCE control
Varies the degree of enhance effect for High Frequency image.

H FREQ GAIN control
Varies the receiver gain of High Frequency image.

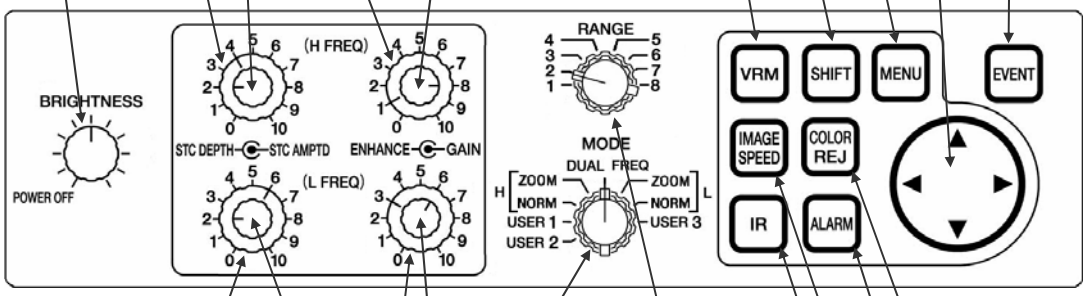
VRM key
Turns on or off VRM. It also selects the VRM mode.

SHIFT key
Turns on or off the image shift mode

MENU key
Turns on or off the menu display.

Four way arrow key
Selects or sets up the menu items, etc.

EVENT key
Registers or updates the event.



L FREQ STC DEPTH control
Varies the effective range of Low Frequency STC in depth

L FREQ STC AMPTD control
Varies the intensity of Low Frequency STC.

L FREQ ENHANCE control
Varies the degree of enhance effect for Low Frequency image.

L FREQ GAIN control
Varies the receiver gain of Low Frequency image.

RANGE switch
Selects the depth range.

MODE switch
Selects the image mode.

COLOR REJ key
Selects the setting of Color Rejection function.

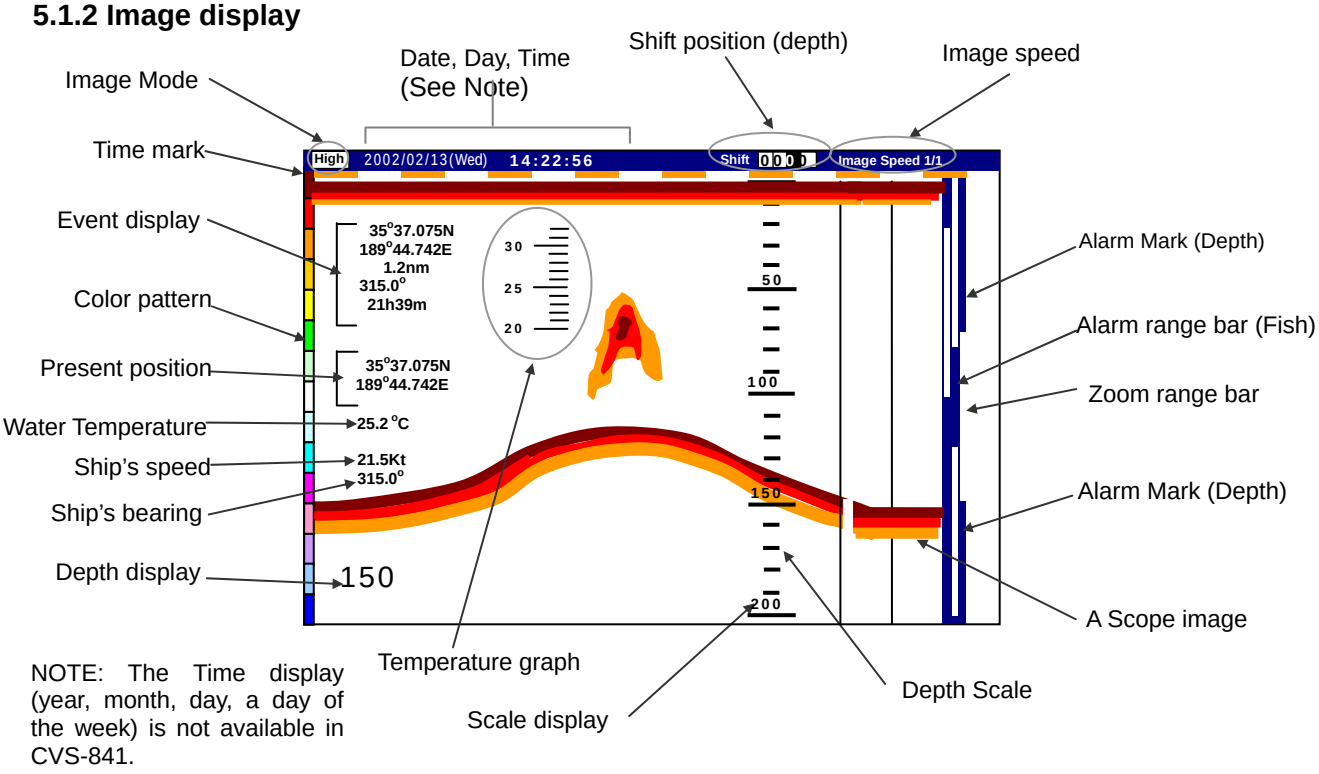
ALARM key
Turns on or off the Alarm. This key is also used to select the alarm setting.

IMAGE SPEED key
Selects the image speed.

IR key
Turns on or off the IR (Interference Rejection) effect. This key is also used to select the IR setting.

Figure 5.2 CVS-851: Details of operating key switches

5.1.2 Image display



NOTE: The Time display (year, month, day, a day of the week) is not available in CVS-841.

Figure 5.3 An example of image display shown on the screen

5.2 Getting started

5.2.1 Turning on

(1) Turn the BRIGHTNESS control to the right until it clicks.

(2) Turn the control gradually to the right until the image brightness becomes an appropriate level.

(3) In a few seconds the following initial display appears showing the sounder type name, status of the transducer connections, depth unit, battery status and the result of the system check.

(4) To switch off the unit, turn the control to the left until it clicks.

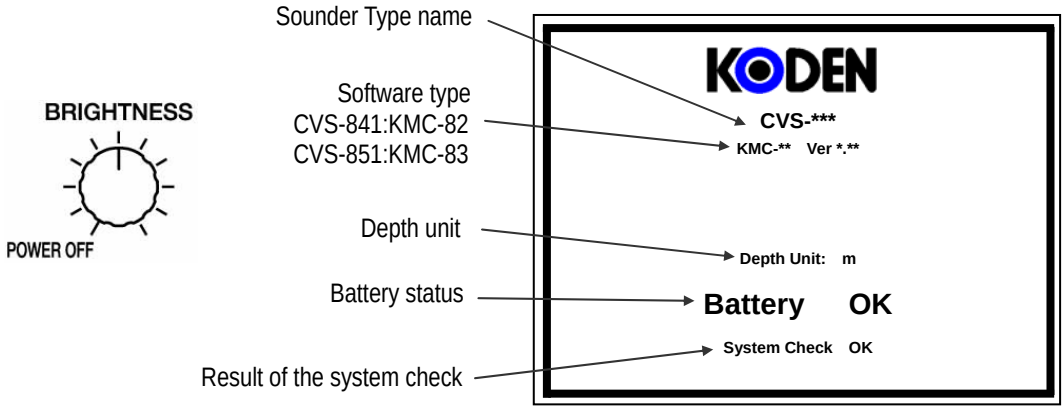


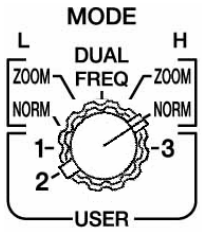
Figure 5.4 Starting up control and display

5.2.2 Selecting NORMAL image mode

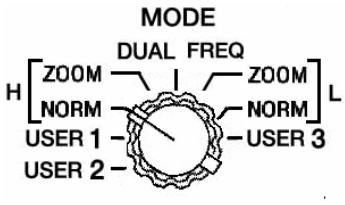
(1) Turn the MODE switch to NORMAL (High or Low).

(2) The selected image display mode will be shown in the center of the screen and it disappears automatically in approximately 5 seconds. The display mode will be shown in the upper left corner of the screen, i.e. “H” for High Frequency and “L” for Low Frequency.

[CVS-841]



[CVS-851]



Selected Frequency notation is shown here.

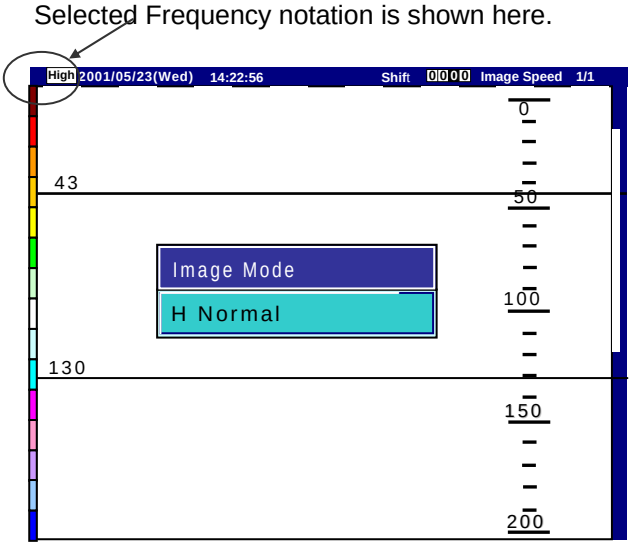


Figure 5.5 Setting and image of NORMAL image mode

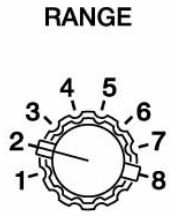
5.2.3 Selecting the depth range

(1) Turn the RANGE switch to select the desired depth range, which is shown on the screen for approximately 5 seconds.

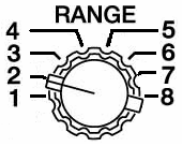
NOTE: Available depth range can be registered to each range number, which is printed around the range scale selector switch. To do so, enter the menu in the following order: For detail, refer to Para. 7.1 “Depth Range registration”.

MENU ⇨ SYSTEM ⇨ Depth Range Preset ⇨ SW1 – SW8 ⇨ ENTER

[CVS-841]



[CVS-851]



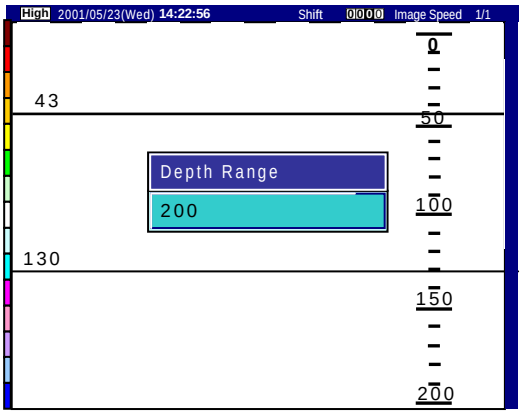


Figure 5.6 Selecting a depth range and its depth display

5.2.4 Setting the receiver gain

Turn the H FREQ GAIN or L FREQ GAIN control as appropriate to make the bottom echo displayed in red.

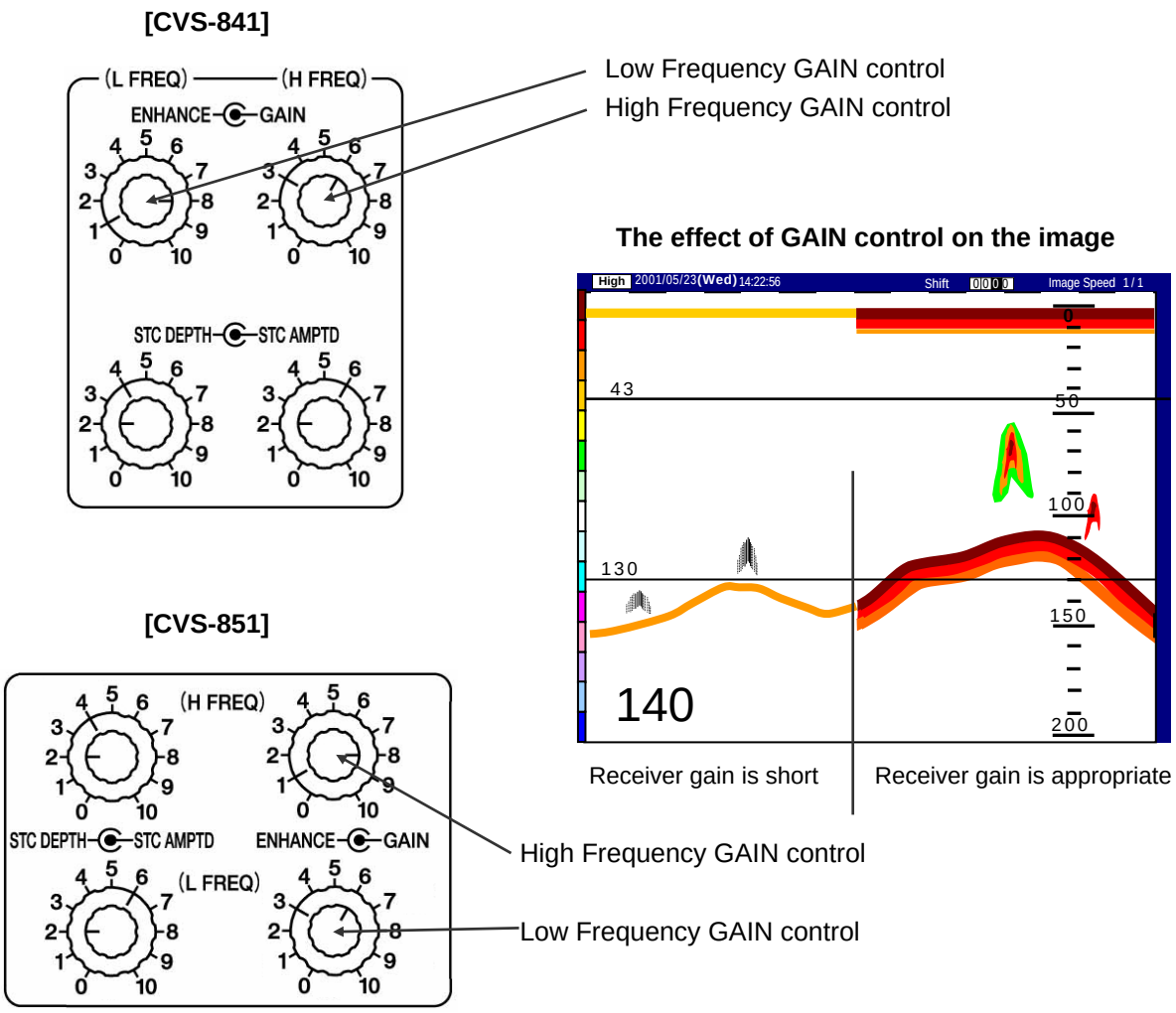


Figure 5.7 Receiver gain controls and the images varied by the gain control

5.2.5 The 3-Divion screen and its gain control

Setting the MODE switch to “3” (CVS-841) or USER 3 (CVS-851) allows the 3-Division screen to be displayed. In this mode, two HIGH Frequency screens (H1 and H2 for convenience) and one LOW Frequency screen are displayed. The unique feature of this mode is an independent gain control of each HIGH Frequency screen.

To vary the gain of L screen:

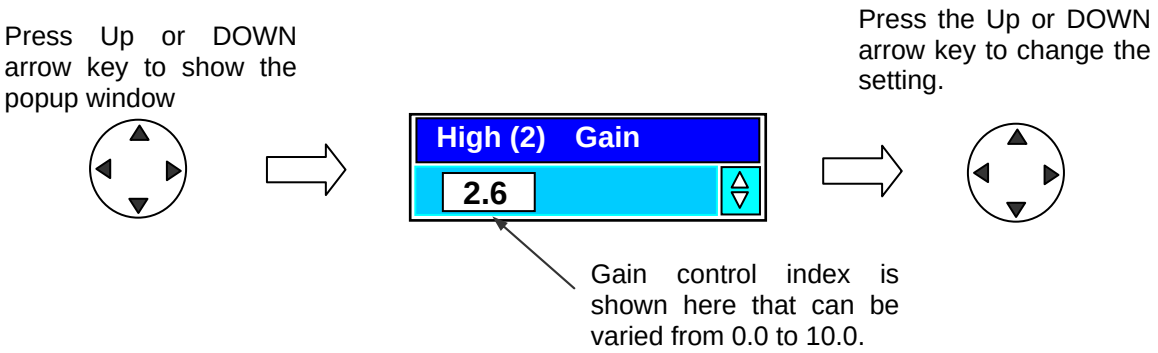
Turn the L GAIN control on the control panel. Turning the control to the right increases the gain and to the left decreases the gain.

To vary the gain of H1 screen:

Turn the H GAIN control on the control panel.

To vary the gain of H2 screen:

Press the UP or DOWN arrow key first. A small pop up window will be displayed. While the window is shown, press the UP or DOWN key to decrease the gain. (UP for increasing the gain, DOWN for decreasing the gain) About 5 seconds after the key is pressed, the window will disappear.


Press Up or DOWN arrow key to show the popup window
Press the Up or DOWN arrow key to change the setting.
High (2) Gain
2.6
Gain control index is shown here that can be varied from 0.0 to 10.0.

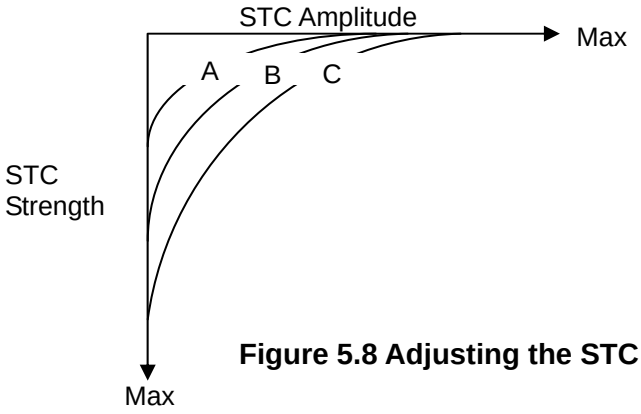
NOTE: When the screen is set to SHIFT mode, the UP and DOWN arrow keys are dedicated for the depth shift setting. To recover the H2 gain control, escape the SHIFT mode first and then press the UP or DOWN arrow key to show the “High (2) Gain” popup window.

5.2.6 Setting the STC

The STC (Sensitivity Time Control) is used to reduce the receiver gain in proportion to time, which is useful to eliminate nearby unwanted echoes like plankton, jelly fish, etc. There are two STC controls provided, STC Depth and STC Amplitude. Refer to the following descriptions of these controls before attempting the operation.

5.2.6.1 Setting the STC Depth

In this mode, you are reducing the receiver sensitivity against the depth in a time proportional law with the STC amplitude fixed. This mode is useful in deep sea fishing to locate a school of fish and the species.



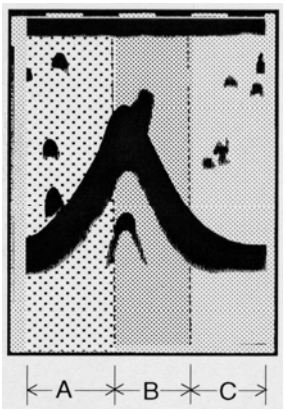


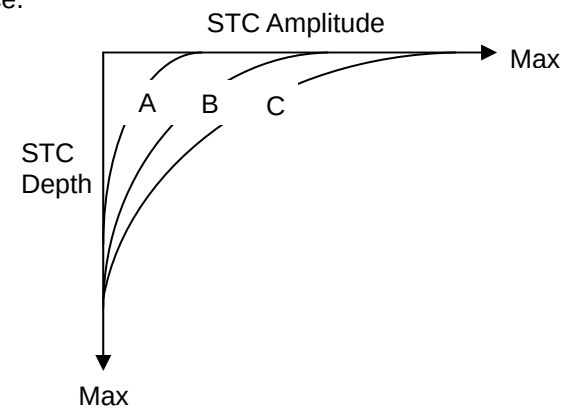
Figure 5.8 Adjusting the STC depth

Operational notes for STC amplitude adjustment

(1) STC law A: STC is not enough, causing noise and unwanted residual weak echoes in shallow and mid depth zone to be shown.
(2) STC law B: STC is appropriate, causing unwanted echoes to be perfectly reduced while schools of fish are shown without degradation.
(3) STC law C: STC is too much, causing the echoes from fish school to be reduced too much.

5.2.6.2 Setting the STC Amplitude

In this mode, you are reducing the receiver sensitivity in a time proportional law with the STC depth fixed. This mode is useful in a shallow water fishing to gain better view of a school of fish near the sea surface.



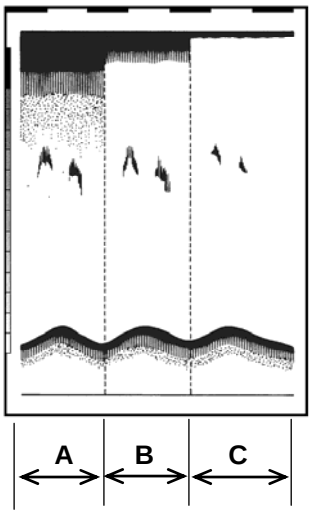


Figure 5.9 Adjusting the STC amplitude

Operational notes for the STC law

- STC law A: STC is not enough, causing the noise and unwanted residual weak echoes in a shallow or mid depth zone to be shown.
- STC law B: STC is appropriate, causing unwanted echoes to be perfectly reduced while schools of fish are shown without degradation.
- STC law C: STC is too much, causing the echoes from fish schools to be reduced too much.

5.2.7 Setting the ENHANCE function

Enhances the picture presentation by narrowing the dynamic range of sonar video signals. Rotating the ENHANCE control to the right causes the seabed and fish echoes to be displayed in dominant colors like red, orange, yellow, etc. for better recognition. Rotating the control to the right causes the shades of colors to be widened for better definition of image colors.

NOTE: Before using this function, the MODE switch must be set to USER 1 position. To change the dynamic range, refer to Para. 7.3 "Setting the Enhance effect".

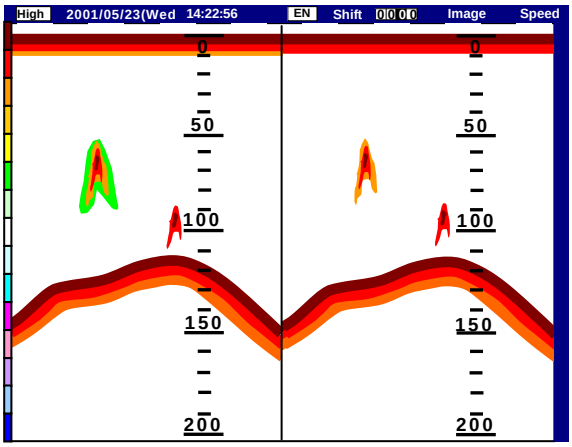


Figure 5.10 The effect of enhance control

5.2.8 Changing the display position in the 3-division screen

Use the following procedure to change the display position.

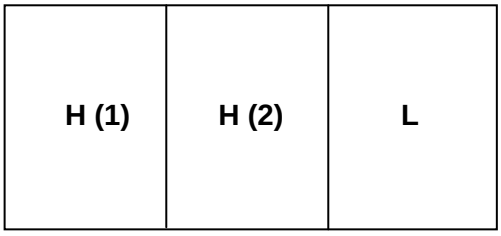
(1) Press the MENU key and select Display. The Display sub menu will be shown.

(2) Select “User 3” and press the Right arrow key to select the User 3 sub menu.

(3) Select a desired display mode among the following options.

a. H (1) / H (2) / L
b. H (2) / H (1) / L
c. L / H (1) / H (2)
d. L / H (2) / H (1)
e. H (1) / L / H (2)
f. H (2) / L / H (1)

The following is an example of the 3-division screen, “a”.



(4) Press the MENU key or press the Left arrow key three times to exit the menu.

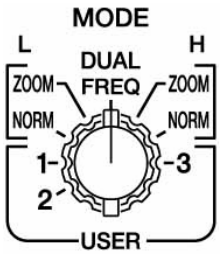
5.3 Displaying the dual images

5.3.1 High Frequency and Low Frequency images

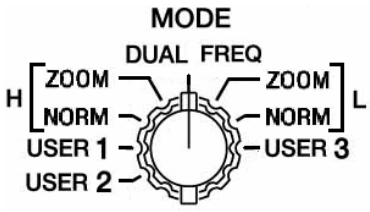
(1) Select DUAL FREQ mode.

(2) Low Frequency image is shown on the left and High Frequency image on the right of the screen.

[CVS-841]



[CVS-851]



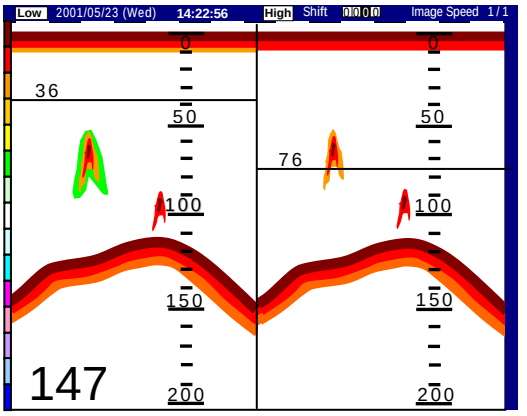


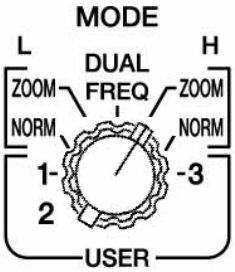
Figure 5.11 Dual Frequency images

5.3.2 High Frequency NORM/ZOOM images

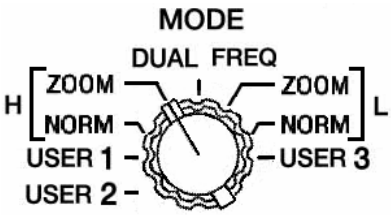
(1) Select High Frequency ZOOM mode.

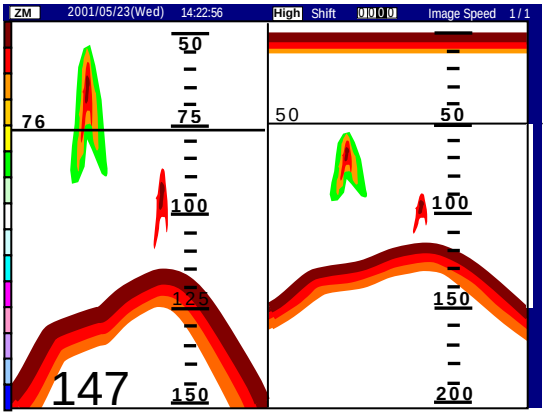
(2) Zoomed High Frequency image is shown on the left and Normal High Frequency image on the right of the screen.

[CVS-841]



[CVS-851]





HIGH Frequency Zoomed image

HIGH Frequency Normal image

Figure 5.12 High Frequency NORM/ZOOM image

The available image has been set to NORM/ZOOM mode. Another form of a zoomed picture is available from; Bottom Lock, Bottom Discrimination, Normal/Zoom or Bottom Lock. To change the setting, refer to Para 7.2.2 “Registering a ZOOM type”.

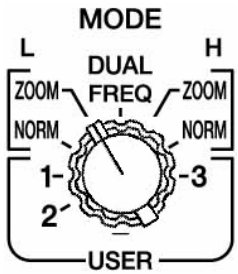
NOTE: *These modes are dual display, available only on the same frequency. The Bottom Zoom image is displayed on a single screen only.*

5.3.3 Displaying Low Frequency NORM/ZOOM image

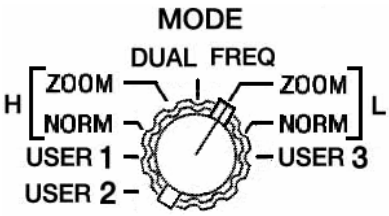
(1) (1) Select Low Frequency ZOOM mode.

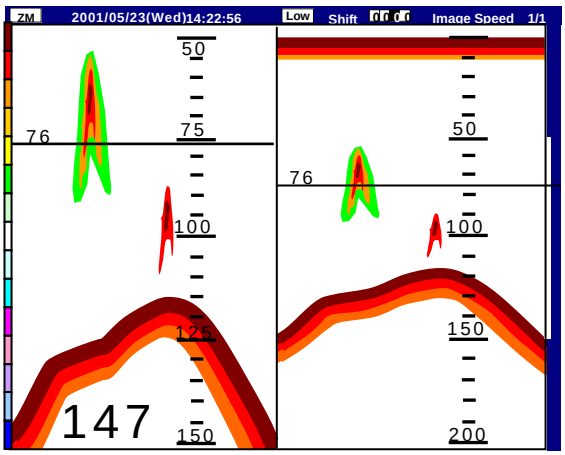
(2) Zoomed Low Frequency image is shown on the left and Normal Low Frequency image on the right on the screen.

[CVS-841]



[CVS-851]





Low Frequency Zoomed image

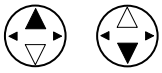
Low Frequency Normal image

Figure 5.13 Low Frequency NORM/ZOOM image

5.3.4 Common key operations

All menu driven functions can be operated using the MENU key and four way arrow keys. Operating procedure are common to all functions, which are as follows:

(1) Press the MENU key to show the main menu list.

(2) Press the up or down arrow key to select a menu item. 

(3) Press the right arrow key to select the sub menu.

(4) Press the up or down arrow key to select an item or set numeric values. The selected or entered value will be fixed when you exit the menu.

(5) To exit from the menu, press the MENU key until normal image is shown.

5.3.5 Setting the partial zoom position in NORM/ZOOM mode

(1) Select ZOOM in NORM/ZOOM mode. To do so proceed as follows:
Menu -> Display -> Zoom Type -> ZOOM

(2) Select Zoom Range. To do so proceed; Menu -> Display -> Zoom Range and then select the zoom range out of the following depth selections.

Depth Unit: meter/hiro/fathom/Italian fathom.

Range selections: 2.5, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80

Depth Unit: feet

Range selections:10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 320, 360, 400, 450, 500, 550, 600, 650

(3) To display Hi Frequency NORM/ZOOM image select H ZOOM, to display the Lo Frequency NORM/ZOOM image select L ZOOM.

(4) Press the VRM key. The digital VRM display in green will be highlighted.

NOTE: *In case the digital display is shown in yellow, press the VRM key to change the display green.*

(5) Press either the up or down arrow key to set an upper limit depth.

The picture on the right shows the display set up in this procedure, Normal Low Frequency range on the right and Zoomed range on the left with zoom starting depth at 50 and zooming range set to 20.

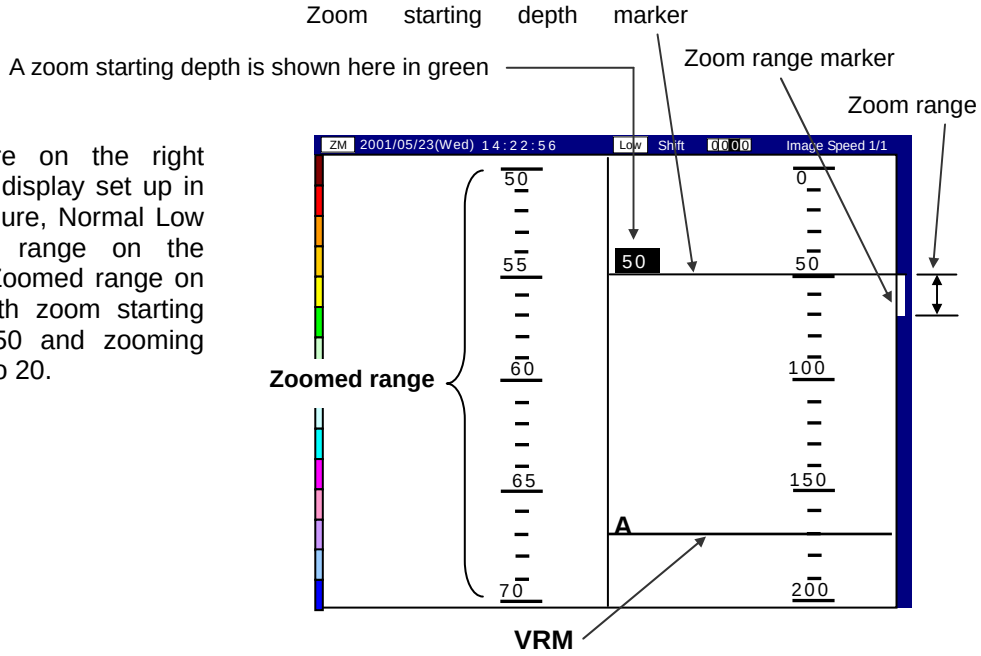


Figure 5.14 Layout of NORM/ZOOM mode display

5.4 Operating the VRM

The VRM (Variable Range Marker) is a moveable depth marker shown as a line across the display, which is used to measure the depth of objects in high accuracy. The VRM may be shown in green or yellow, i.e. green VRM for setting the zoom starting depth and yellow for normal VRM.

5.4.1 Using the VRM in NORMAL mode

(1) Press the VRM key. The digital VRM display previously activated is shown highlighted (black letters with green background)

(2) Move the UP or DOWN key to move the VRM up or down.

NOTE: *The VRM can be moved only when the VRM digit display is highlighted.*

(3) To change the VRM control from one to the other, press the VRM key while the VRM digital display is highlighted. The highlighted digital display is also changed from one to the other.

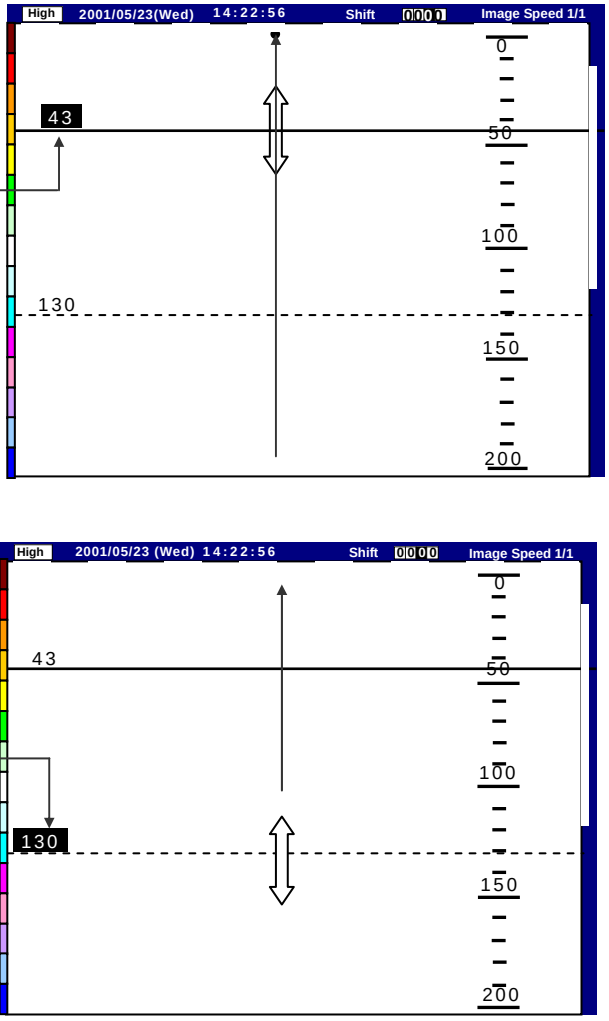


Figure 5.15 Operating the VRM

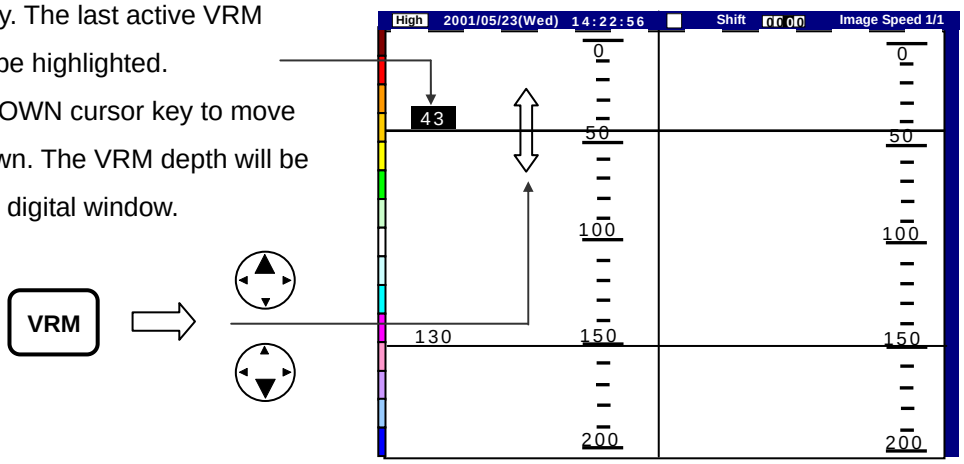
NOTE*: After 5 seconds if the VRM is not operated, the VRM digital display returns to be non-highlited, causing the VRM inoperative. To resume the VRM operation, press the VRM key again. The last activated VRM will be made available. (The above example shows a VRM marked with 130 available)*

5.4.2 Using the VRM in Dual Image mode

5.4.2.1 Vertical split screen, Dual Frequency mode

(1) Press the VRM key. The last active VRM digital display will be highlighted.

(2) Press the UP or DOWN cursor key to move the VRM up or down. The VRM depth will be shown in the VRM digital window.



(3) To change the VRM control from one to the other, press the VRM key while the VRM digital display is highlighted. The highlighted digital display changes to active VRM.

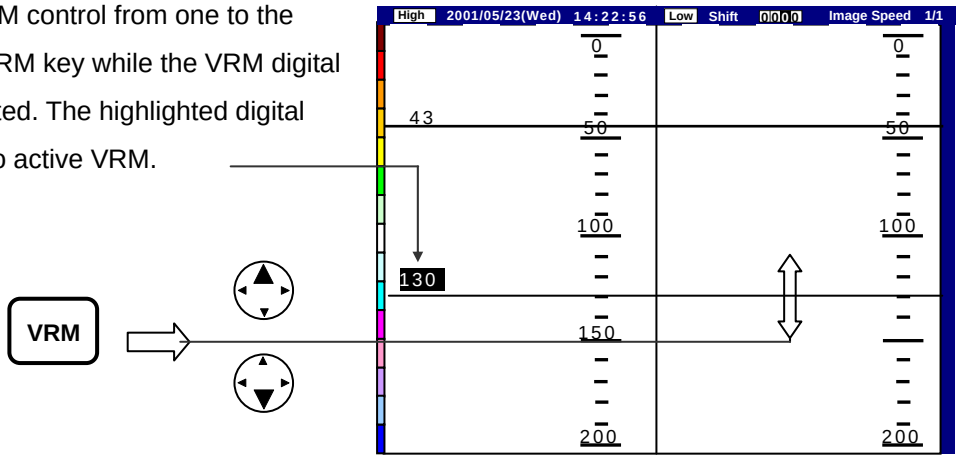


Figure 5.16 Operating the VRM in Vertical Split, Dual Frequency mode

`

5.4.2.2 Vertical split screen, NORM/ZOOM image mode

(1) Press the VRM key. The last active VRM digital display will be highlighted.

(2) Press the UP or DOWN cursor key to move the VRM up or down. The VRM depth will be shown in the VRM digital window.

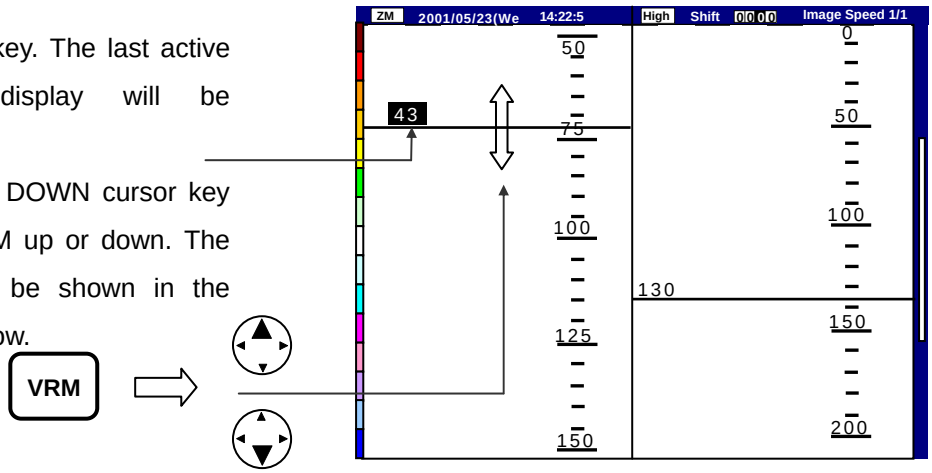


Figure 5.17 Operating the VRM in Vertical Split, NORM/ZOOM image mode (1)

(3) To change the VRM control from one to the other, use the following procedure:

(4) To activate the left VRM, press the LEFT arrow key and the RIGHT VRM, press the right arrow key.

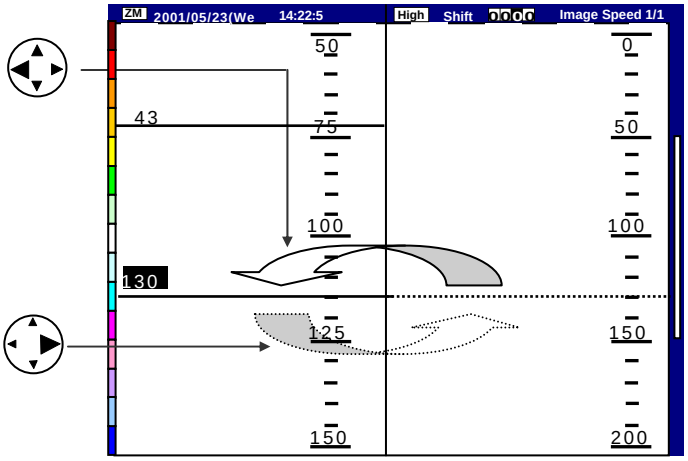


Figure 5.18 Operating the VRM in Vertical Split, NORM/ZOOM image mode (2)

5.4.2.3 Horizontal split screen, Dual Frequency mode

(1) Press the VRM key. The last active VRM digital display will be highlighted.

(2) Press the UP or DOWN cursor key to move the VRM up or down. The VRM depth will be shown in the VRM digital window.

(3) In case VRM stretches from one screen to the other, the VRM digit display indicates the depth of the new screen.

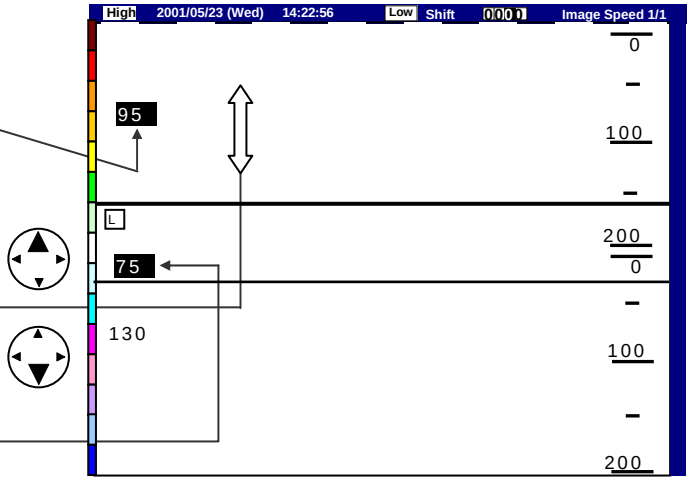


Figure 5.19 Operating the VRM in Horizontal Split, Dual Frequency mode

5.4.2.4 Horizontal split screen, NORM/ZOOM image mode

(1) Press the VRM key. The last active VRM digital display will be highlighted.

(2) (2) Press the UP or DOWN cursor key to move the VRM up or down. The VRM depth will be shown in the VRM digital window.

(3) In case VRM goes beyond from one screen to the other, the VRM digit display indicates the depth of the new screen.

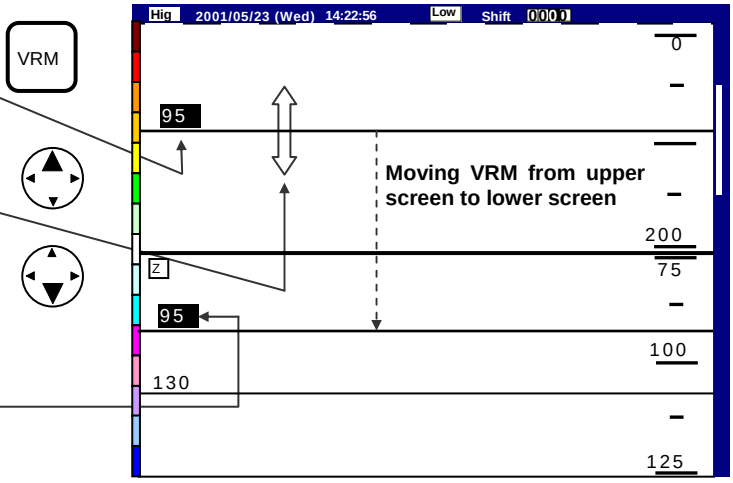


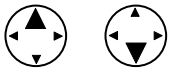
Figure 5.20 Operating the VRM in Horizontal Split, NORM/ZOOM mode

5.5 Selecting the image speed

The image speed is related to the frequency of transmission. For instance, an image speed of 2/1 indicates that the image is moved twice each time transmission takes place. To select the image speed:

(1) Press the IMAGE SPEED key. A pop-up window will appear.

(2) Press either the UP or DOWN arrow key to select the image speed ratio. The available speed selections are as follows:



4/1 3/1 2/1 1/1 STOP 1/2 1/3 1/4 1/6 1/8 1/12 1/16 1/32

(3) The pop-up window will automatically disappear in 5 seconds after operation.

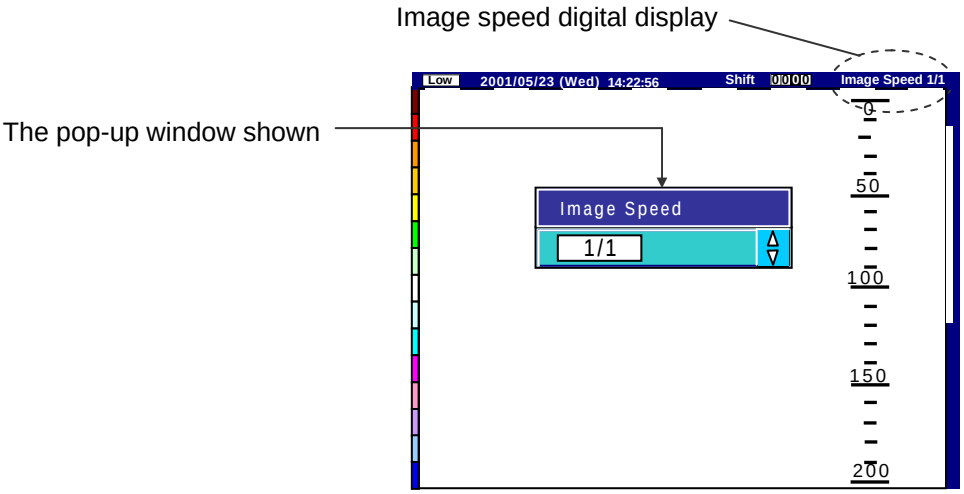


Figure 5.21 Image speed display

5.6 Activating the IR function

When other sounders are operated on board the ship or on other ships nearby, acoustic interference may be observed, shown across or diagonally on the screen in a series of short lines, dots, etc. In such a case, use this function.

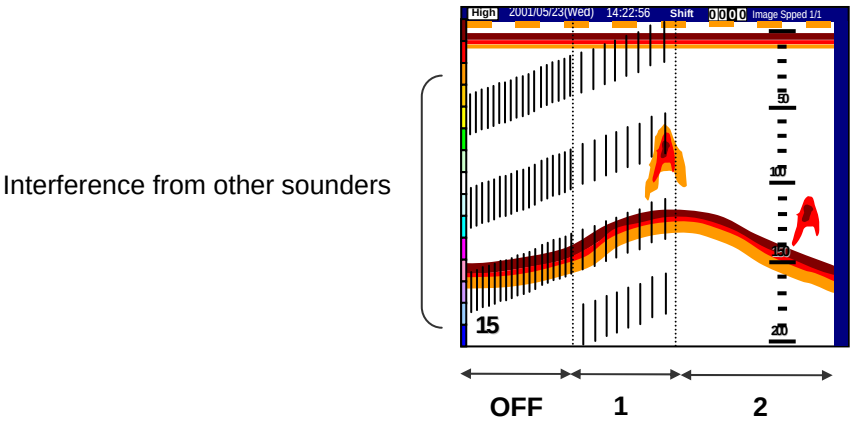


Figure 5.22 The effect of IR function

To use:

(1) Press the IR key. Pop-up window will appear here on the screen.

(2) Press the UP or DOWN arrow key to change the IR setting that varies from OFF, 1 (Mid) and 2 (Intense).

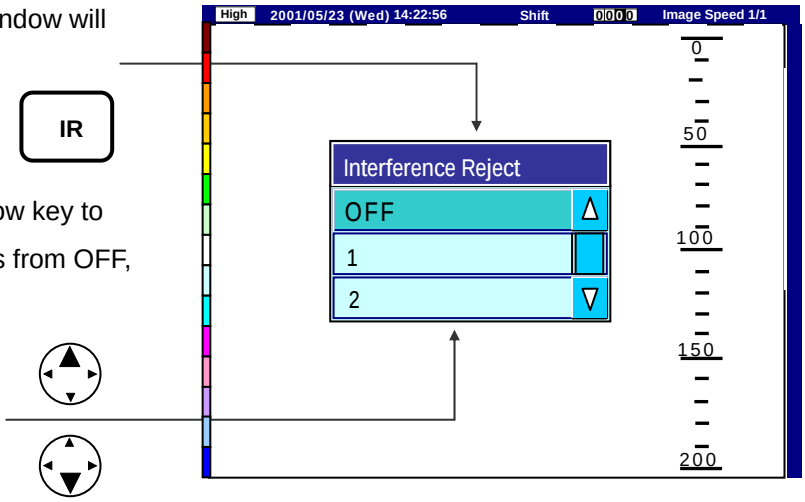


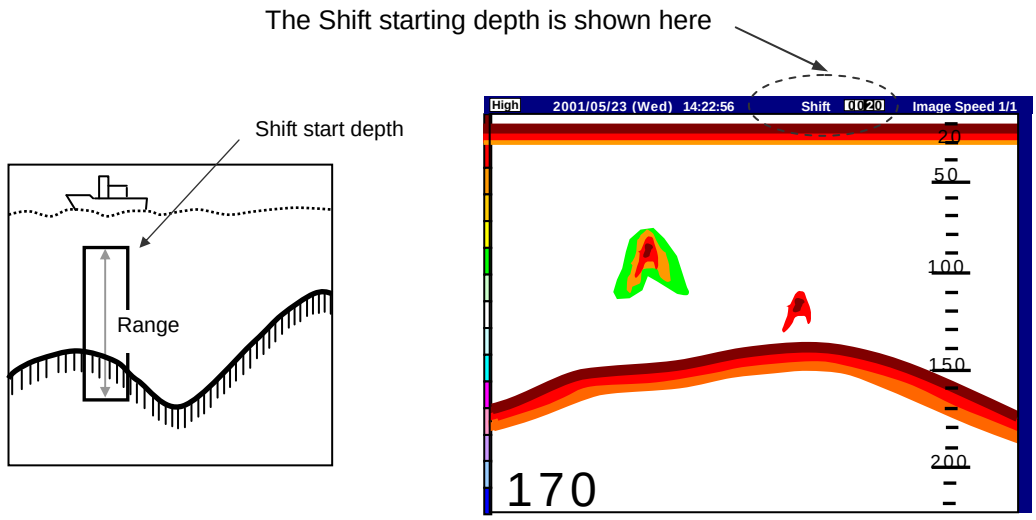
Figure 5.23 The IR Reject select display

5.7 Operating the SHIFT key

In NORMAL mode screen, there are two shift modes available, Fix Shift and Normal Shift. In Fix Shift mode, a viewable depth is fixed with starting depth and the fixed depth scale. In Auto Shift mode, the sea bottom always appears within the screen whereby sounding range varies in order to keep the sounding image shown within the screen. In practice, when the sea bed becomes shallower reaching 40 % of the depth range, the image will be reset causing the sea bed depth displayed at approximately 60% of the entire range. When the sea becomes deeper and the bottom falls to 90 % of the depth scale, the picture resets to the same position (60%).

5.7.1 Setting Fix Shift mode

(1) Select a depth range scale to allow the sea bottom to be shown.
(2) Press the SHIFT key.
(3) Press the left or right arrow key to select a digit of the shift start depth, which is shown on the top of the screen.
(4) Enter a depth value by pressing the up or down arrow key.
(5) To cancel the Fix Shift function, press the SHIFT key again.



.

Figure 5.24 Fix Shift mode display

5.7.2 Setting the Auto Shift function

(1) To display Auto Shift image, first select AUTO SHIFT in the menu. The word AUTO SHIFT will appears on the upper side of the screen.

(2) Press the SHIFT key to display Auto Shift image.

(3) To cancel Auto Shift mode, press the SHIFT key again.

When the seabed depth becomes shallower than 40% or, deeper than 90% of the full depth scale, the entire image will be reset to 65% of the scale.

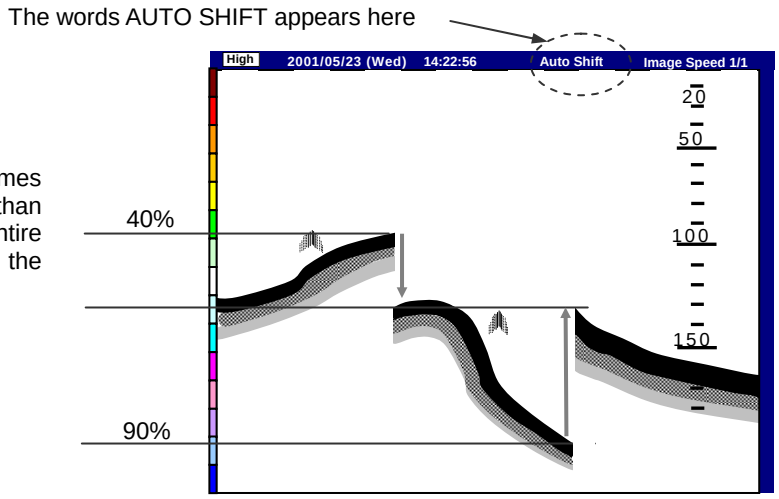


Figure 5.25 The Auto Shift image

5.8 Using the Color Rejection function

To reduce unwanted echoes like boat noise, marine life, those shown in weaker colors like pale blue, pale green, etc. use this function. Sonar echoes in specific colors may be reduced, causing the image to become clearer.

(1) Press the COLOR REJ key. The Color Rej pop-up window will appear.

(2) Press the up or down arrow key to select colors to be rejected from color palette. A blue small square mark moves up or down according to the key entry.

(3) Press the left arrow key to reject the selected color. To resume the color, press the right arrow key.

(4) The pop-up window will automatically disappear in 5 seconds after the operation.

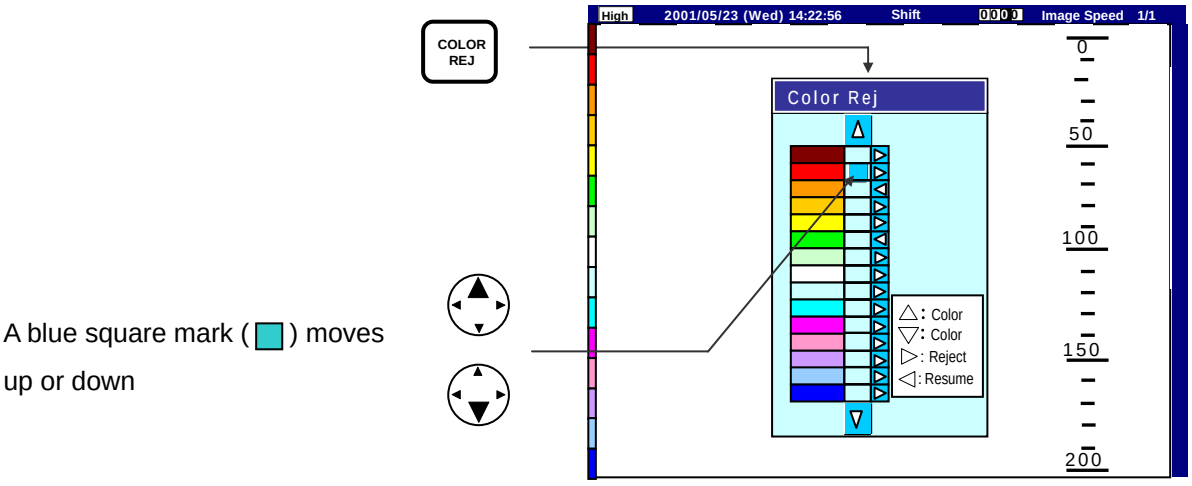


Figure 5.26 Color Rejection select display (1)

Pressing the left arrow key rejects the specified color(s), and therefore is removed from the color bar shown on the left.

Pressing the right arrow key resumes the color(s).

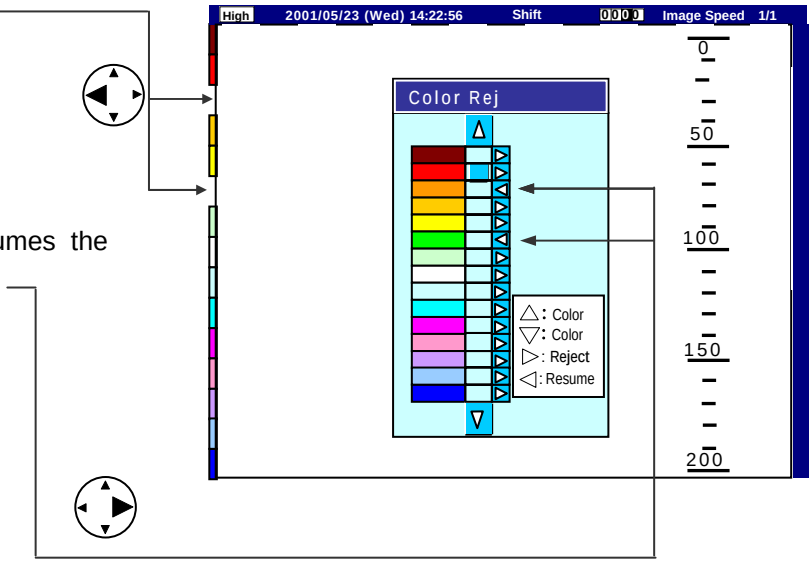


Figure 5.27 Color Rejection select display (2)

5.9 Setting the Alarm Function

There are two alarms available, the Depth Alarm and Fish Alarm.

5.9.1 Depth alarm

The Depth alarm is activated when the sea bottom becomes shallower or deeper than a preset depth range. Refer to Figure 5.29 for detail. Pressing any key on the operation panel silences the alarm.

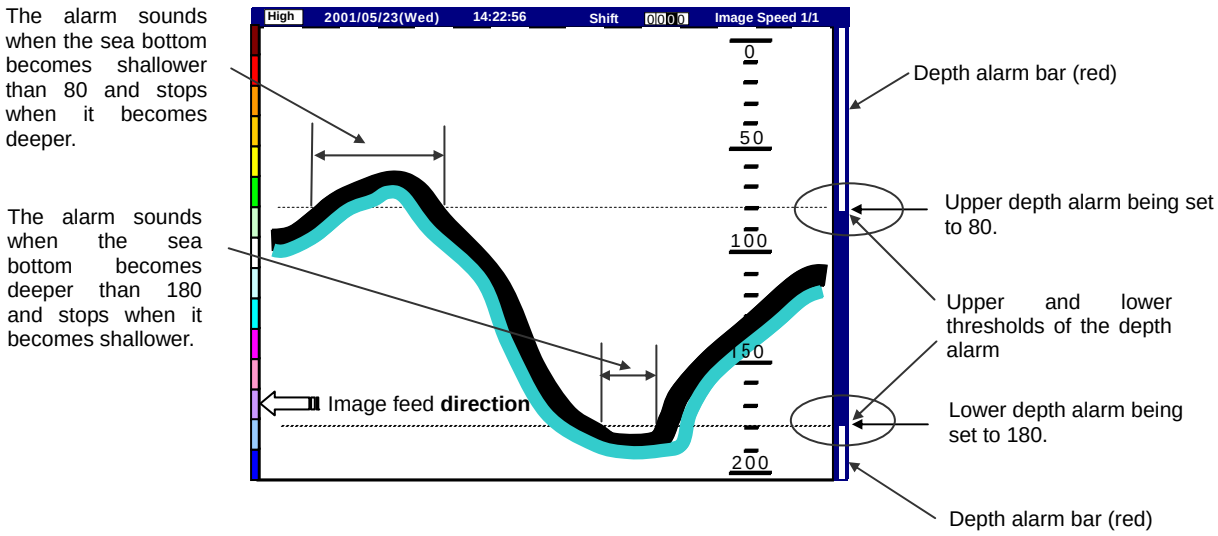

The alarm sounds when the sea bottom becomes shallower than 80 and stops when it becomes deeper.
The alarm sounds when the sea bottom becomes deeper than 180 and stops when it becomes shallower.
High
2001/05/23(Wed)
14:22:56
Shift
Image Speed 1/1
0
50
100
150
200
Image feed direction
Depth alarm bar (red)
Upper depth alarm being set to 80.
Upper and lower thresholds of the depth alarm
Lower depth alarm being set to 180.
Depth alarm bar (red)

Figure 5.28 Depth Alarm display

To use this function:

(1) Press the ALARM key. A pop-up window appears on the screen.

(2) Press the up or down key to select DEPTH ALARM.

(3) Press the right arrow key to enter the depth alarm setting menu and then press the down arrow key to set the depth alarm ON. Now you need to set upper and lower limit of the fish alarm. Perform the following procedure in order:

Setting the Upper Alarm

(1) Press the right arrow key to select Upper Alarm.

(2) Press further the right arrow key to show an alarm range window.

(3) Press the up or down arrow key to set the alarm depth (80 for example). The upper end of the Depth Alarm bar will be set to 80.

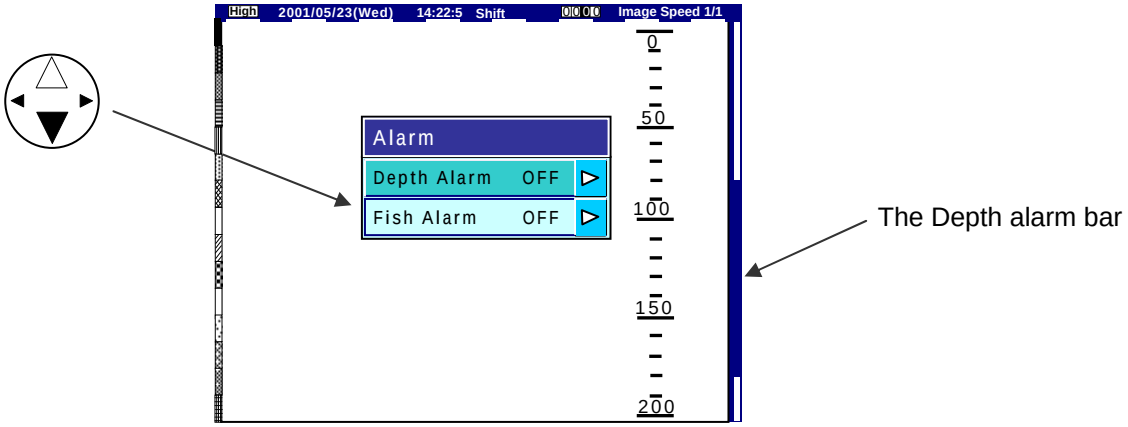


Figure 5.29 The Depth Alarm select display

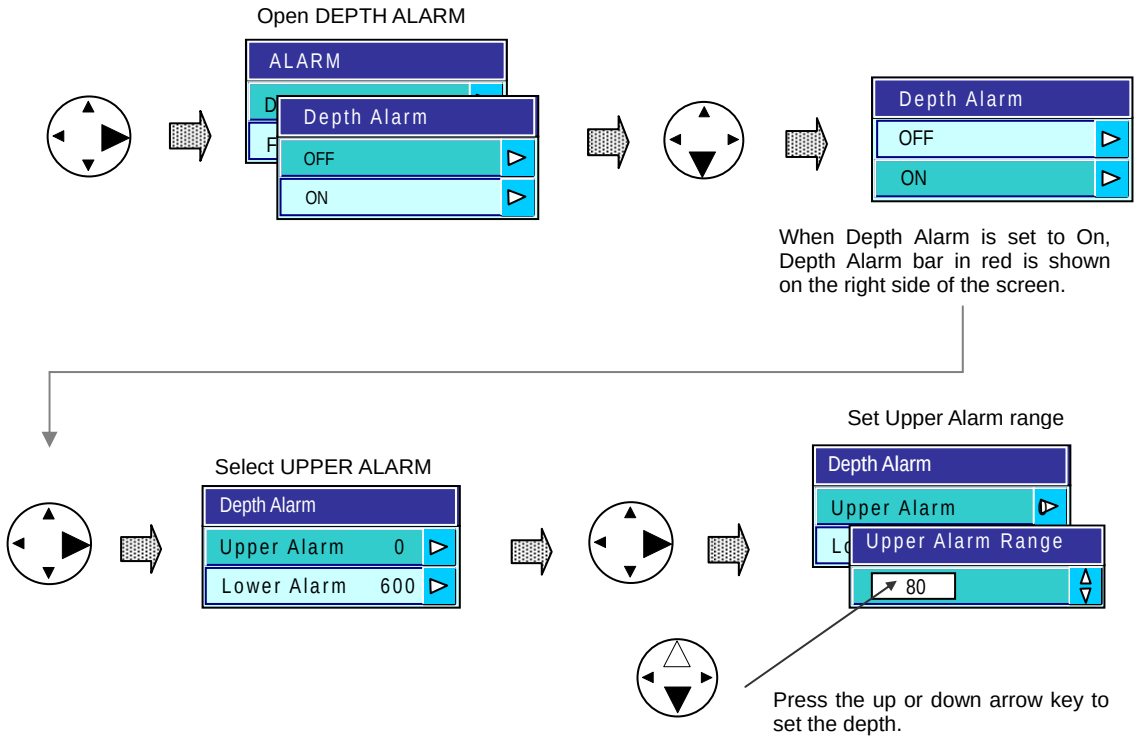


Figure 5.30 Selecting the Depth Alarm

Setting the Lower Alarm

(1) Press the ALARM key or Left arrow key to display the Depth Alarm window.

(2) Press the down arrow key to select LOWER ALARM.

(3) Press the right arrow key. The Lower Alarm digital window will appear.

(4) Press the upper or lower arrow key to enter the depth.

Exiting the Depth Alarm

Press the ALARM key or left arrow key four times. Or, press the MENU key twice.

5.9.2 Fish alarm

The Fish Alarm is an audio alarm, which is activated when fish echoes enter a predetermined depth range or fulfill the predetermined threshold in terms of its signal intensity and length. Pressing any key on the operation panel can silence the alarm. Further detection of echoes will activate the alarm again.

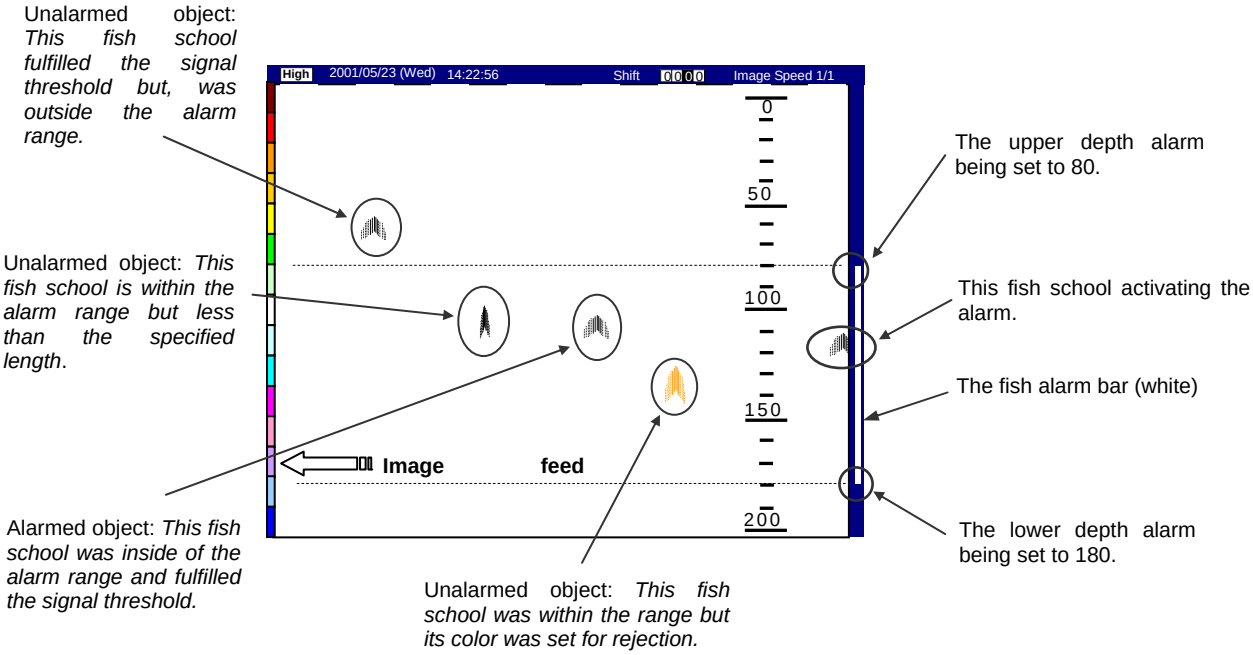

Unalarmed object: *This fish school fulfilled the signal threshold but, was outside the alarm range.*
Unalarmed object: *This fish school is within the alarm range but less than the specified length.*
Alarmed object: *This fish school was inside of the alarm range and fulfilled the signal threshold.*
Unalarmed object: *This fish school was within the range but its color was set for rejection.*
The upper depth alarm being set to 80.
This fish school activating the alarm.
The fish alarm bar (white)
The lower depth alarm being set to 180.
High
2001/05/23 (Wed) 14:22:56
Shift
Image Speed 1/1
0
50
100
150
200
Image feed

Figure 5.31 The Fish Alarm display

Setting procedure

Setting the Upper and Lower Fish Alarms:

(1) Press the MENU key to show the main menu.

(2) Press the up or down key to highlight FISH ALARM.

(3) Press the right arrow key to show FISH ALARM ON/OFF.

(4) Press the up or down arrow key to select FISH ALARM ON.

(5) Press the right arrow key to show UPPER FISH ALARM.

(6) Press the right arrow key to show the depth value window for UPPER FISH ALARM.

(7) Press the up or down arrow key to enter the MSB depth value.

(8) Press the right arrow key to shift the digit and again press the up or down arrow key to enter the LSB depth value.

In a similar manner, set the Lower Fish Alarm.

When finished, the Fish Alarm bar will be set to indicate upper and lower alarm limit.

Setting the Alarm color:

(Assuming the main menu is shown)

(1) Press the up or down key to highlight ALARM COLOR.

(2) Press the right arrow key to select ALARM COLOR selection menu.

(3) Press the up or down arrow key to select the color.

Setting the Alarm Signal length:

(Assuming the main menu is shown)

(1) Press the up or down key to highlight ALARM SIGNAL COLOR.

(2) Press the right arrow key to select ALARM SIGNAL LENGTH selection menu.

(3) Press the up or down arrow key to select the length.

To exit these menus from the bottom line, press the left arrow key four times or, press the MENU key twice.

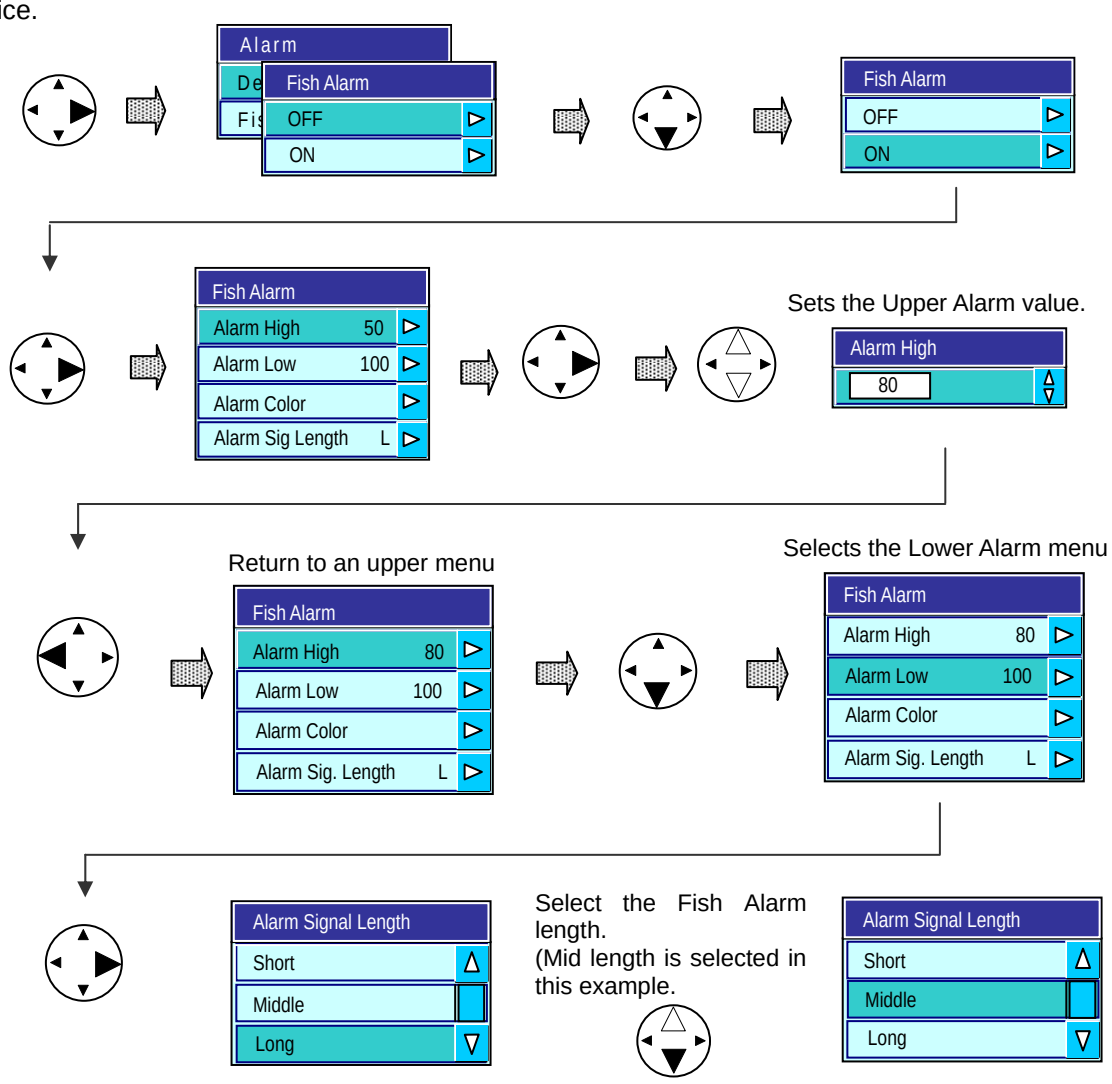


Figure 5.32 Setting the Fish Alarm – Alarm signal length

Now, return to upper level menu to proceed to next setting, the Signal Color.

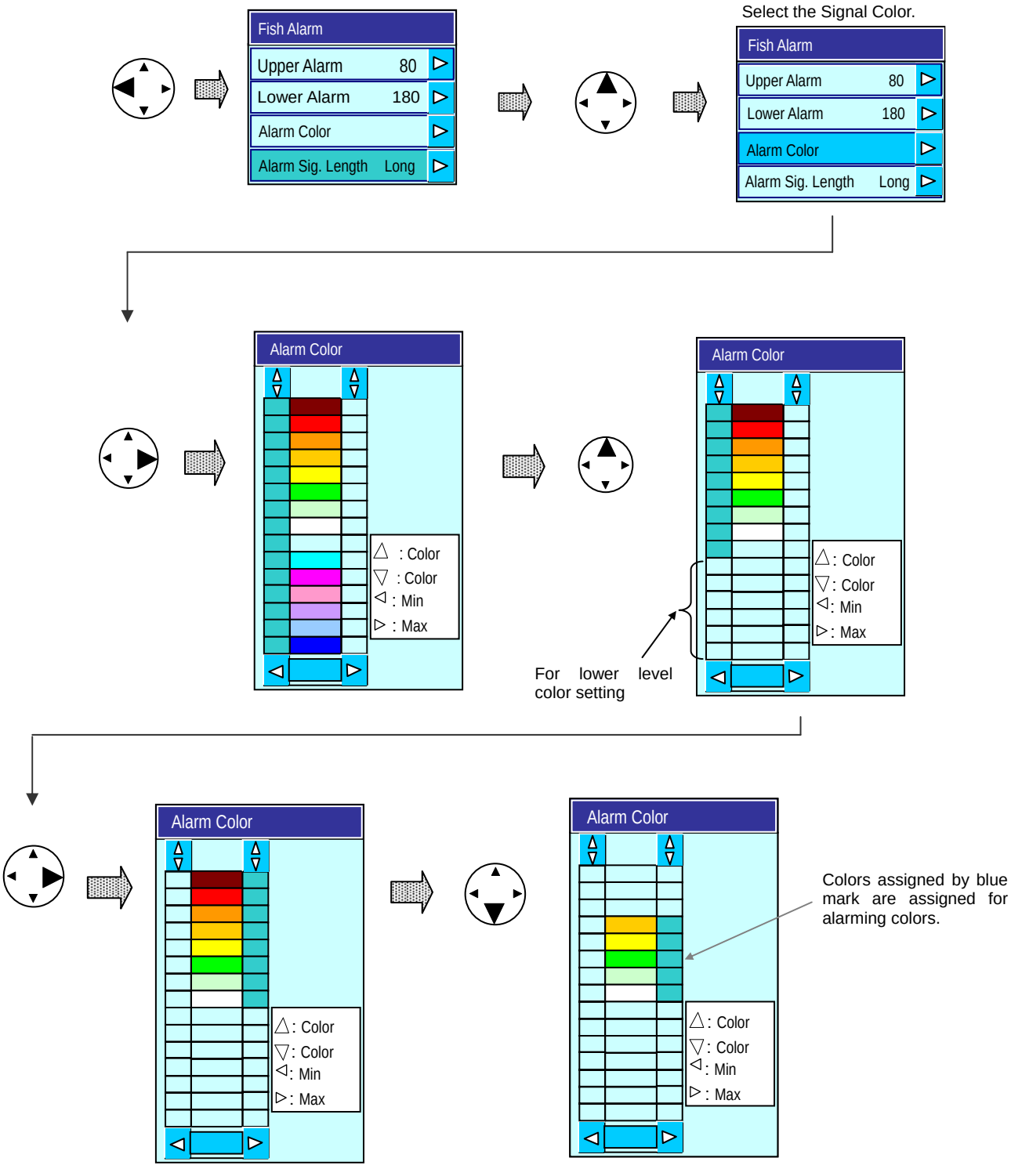


Figure 5.33 Setting the Fish Alarm – Alarm signal color

To exit from this menu, press the ALARM key switch. ALARM

5.10 Operating the EVENT key

The EVENT key is used to mark ship's position instantly, useful for storing the position of an event such as a man-overboard accident, a dense fish-echo sounding, etc. To use this function, simply press the EVENT key switch. The EVENT information will be shown in the upper left corner of the screen that include the following:

(1) Ship's position in latitude and longitude

(2) Bearing and distance to the EVENT mark from own ship

(3) Time elapsed from when the EVENT was marked

Subsequent pressing of the EVENT key will update the above information.

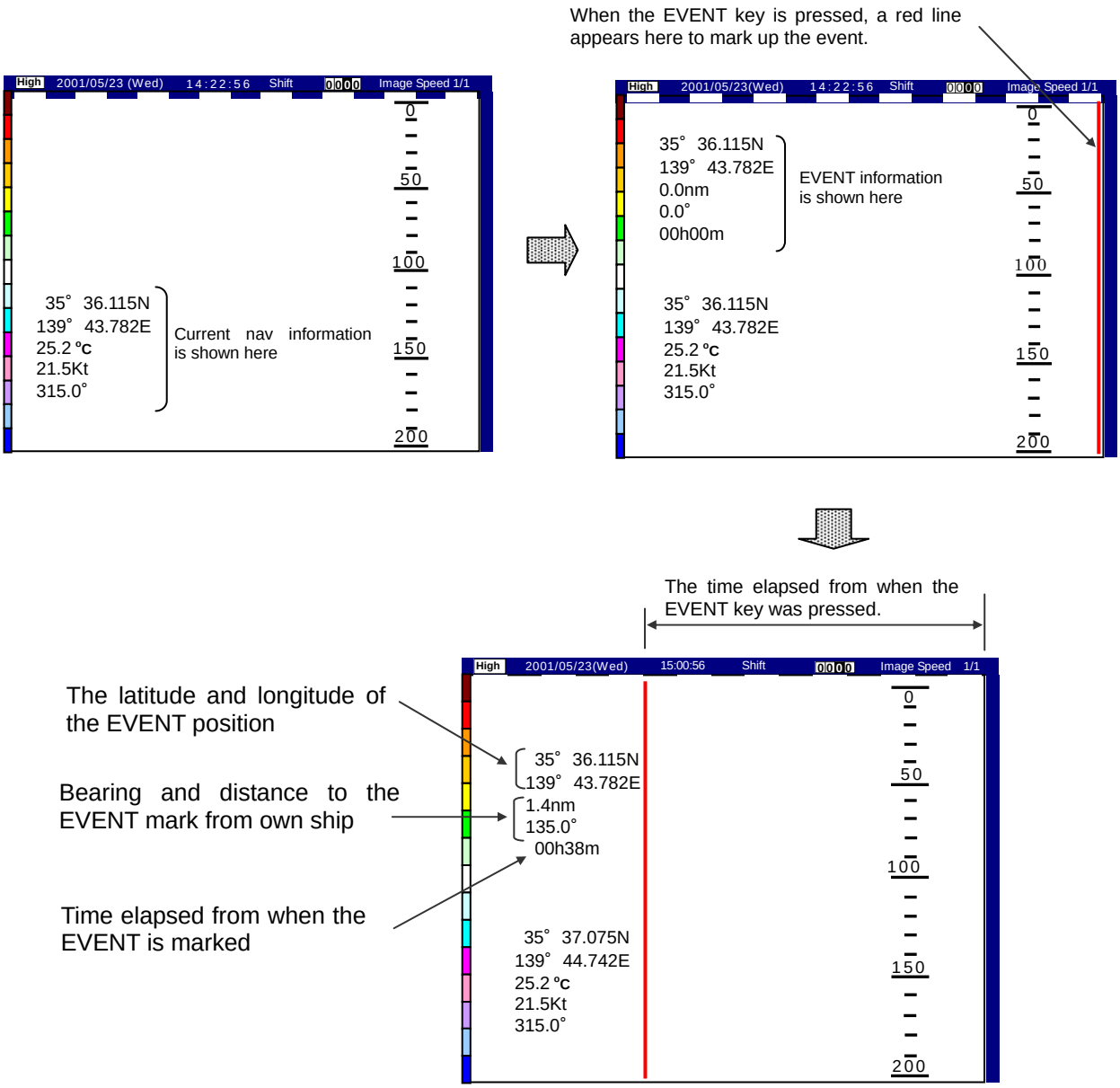


Figure 5.34 The Event display

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Chapter 6 Using the menu

6.1 The key switches used

This chapter describes the operating procedures of menu driven functions, which is activated by pressing the MENU key switch. The following key switches are used for the menu, with their locations shown in Figure 6.1.

- Menu key
- 4-way arrow key

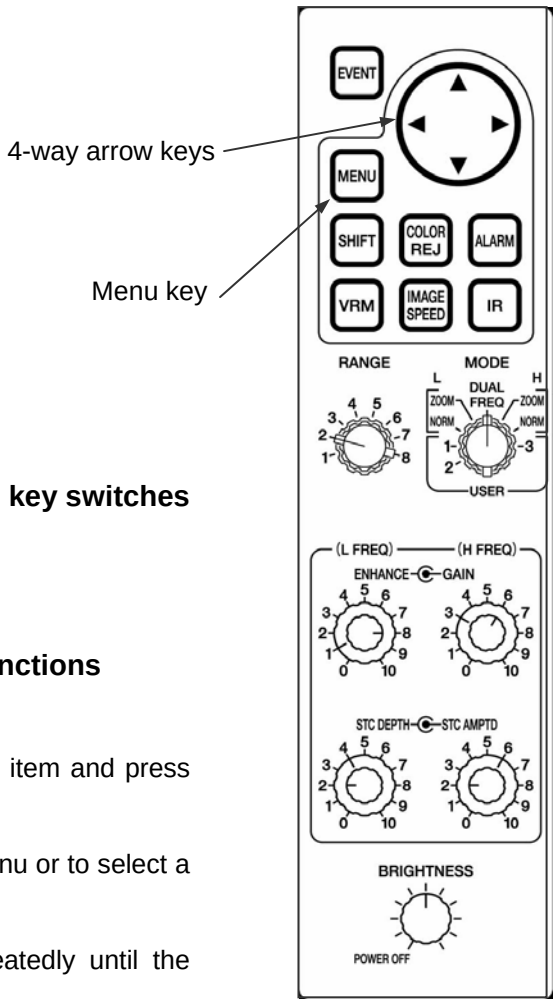


Figure 6.1 Locations of the key switches

6.2 Operating procedure of the menu driven functions

1. Press the MENU key to show the Main Menu.
2. Press the up or down arrow key to select a menu item and press the right arrow key to show its sub menu list.
3. Press the up or down arrow key to select a sub menu or to select a numerical value.
4. Press the MENU key or the left arrow key repeatedly until the normal screen display is shown.

The above procedures are illustrated as follows with actual menu windows shown.

[Displaying the Main Menu]

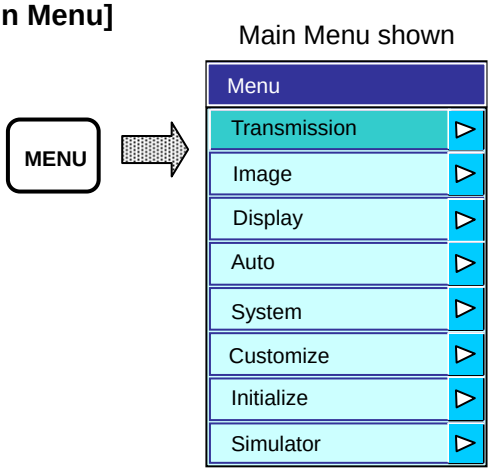
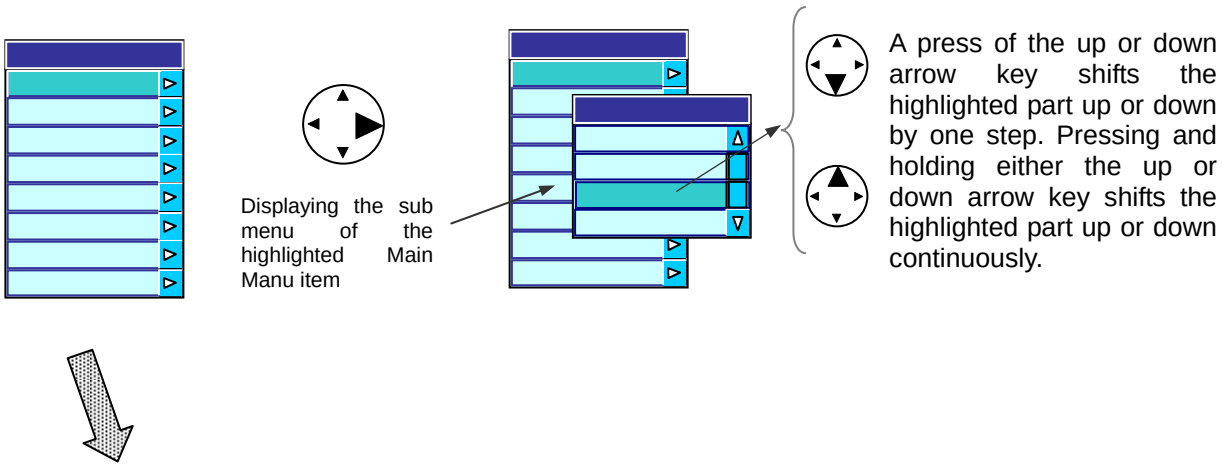


Figure 6.2 Main Menu display

[Selecting a sub menu item]


Displaying the sub menu of the highlighted Main Manu item
A press of the up or down arrow key shifts the highlighted part up or down by one step. Pressing and holding either the up or down arrow key shifts the highlighted part up or down continuously.

[Selecting a sub menu item with value settings]

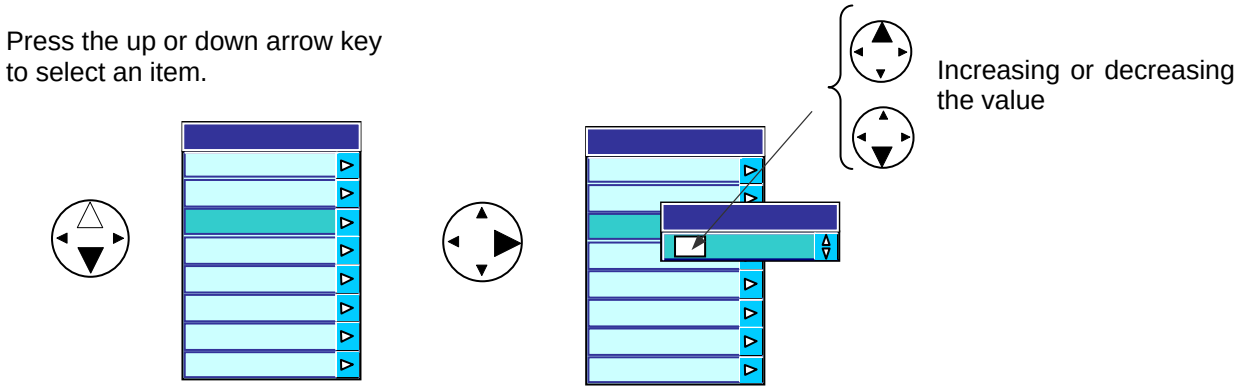
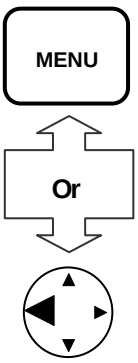


Figure 6.3 Common key switch operating order

[Returning to a previous menu]

Press the MENU key or the left arrow key to return to a previous menu. To return to the normal display, press either of these keys repeatedly.



6.3 Confirming the factory initial settings

> **CAUTION:** *The unit has been set to factory initial settings. Before operating the unit, confirm their settings by using the following procedure.*

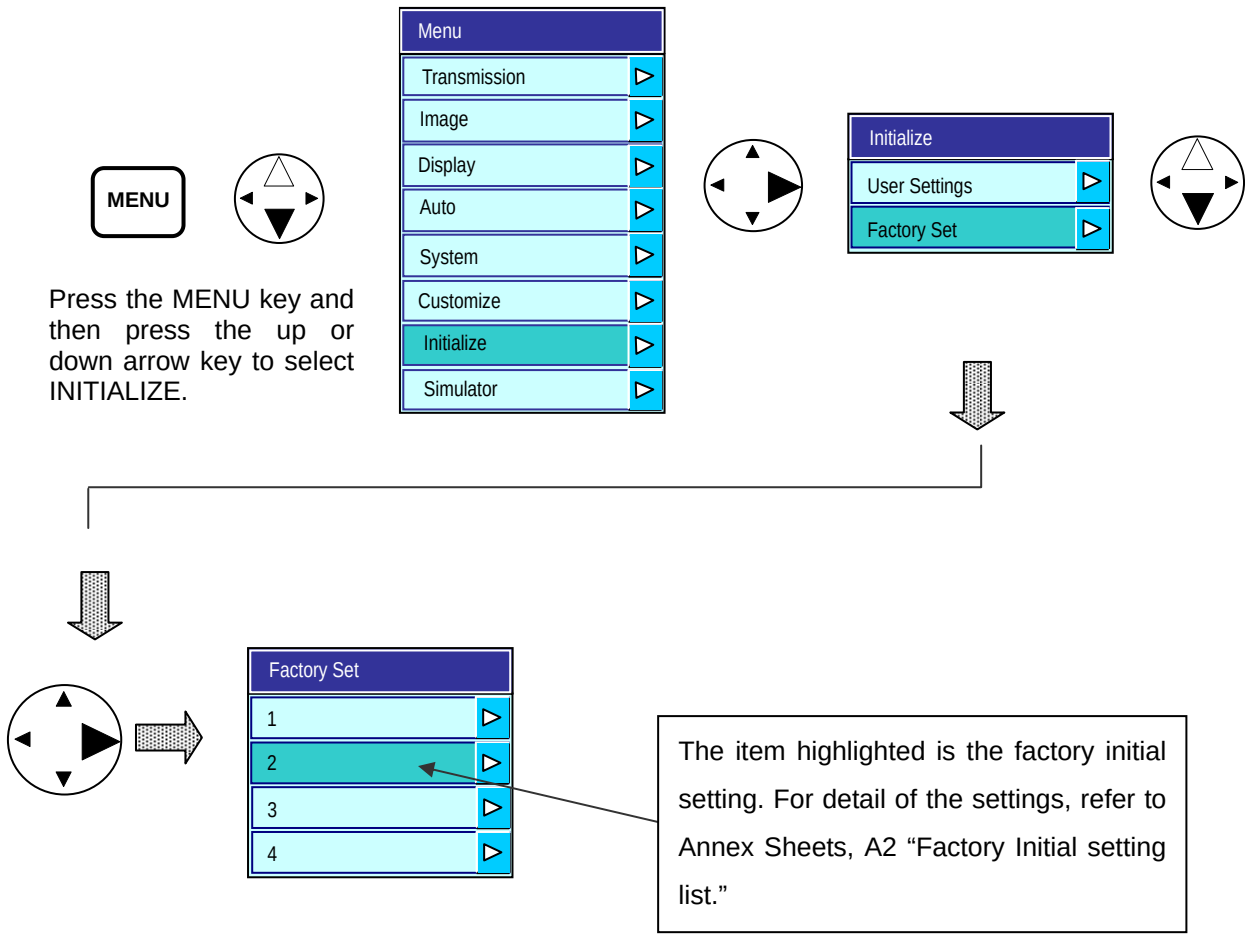
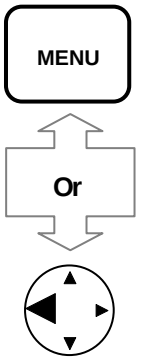


Figure 6.4 Selecting the factory settings

To exit from the menu, press the MENU key or the left arrow key 3 times.



6.4 Menu list

Menu	Sub Menu 1	Sub Menu 2	Parameters
Transmission	Pulse Width (H)		Super Short, Short, Middle, Long
	Pulse Width (L)		Super Short, Short, Middle, Long
	Output		Normal, Low
	PRR		1 - 10
Image	Enhance		25、35,45,55,65
	Color Tone		1 - 3
	Background Color		1 - 9
	White Line		OFF, 1 - 5
	Mix Type		A, B, C
	Flicker Rejection		OFF, ON
	Past Image		OFF, ON
Display (Note1: The Information Window feature is not available in CVS-841)	A Scope		OFF, ON
	Information Window (Note 1)		OFF, ON
	Zoom Type		BTM, BD, ZOOM, B.Z
	Zoom Range		2.5 - 200
	User 1		
	User 2		
	User 3		
	Depth Value		OFF, Large, Middle, Small
	Depth Value Position		Bottom, Top
	Scale		OFF, Single, All
	Scale Position		Side, Center
	Scale Value		Large, Small
	Time Mark		OFF, 10 sec, 1 min
	Image Direction		←|←, ←|→ , →|→
	Image Partition		◫ ⊟
	Image Swap		A|B, B|A
	Color Bar Scale		OFF, ON
	Present Position		OFF, L/L, LOP
	Boat Speed		OFF, kt, km/h, mph
	Bearing		OFF, ON
	Water Temp		OFF, °C, °F
	Water Temp Graph		OFF, ON
	Event Position		OFF, ON
	Event Distance		OFF, ON
	Event Direction		OFF, ON
	Event Elapsed Time		OFF, ON
Automatic	Auto Range		OFF, ON
	Auto Shift		OFF, ON
System (Note2) The Time feature is not available in CVS-841.	Time (Note2)		Year, Month, Day, Hour, Min, Sec
	Depth Unit		M, J.fm, fm, I.fm, ft
	Depth Range Preset		
	Draft Setting		0.0 to 25.5
	Bottom Start		0.0 to 20.0
	Bottom Detection		Inside Range, Outside range
	Bottom Detection Threshold		-80 to +40

(Menu list)

Menu	Sub Menu 1	Sub Menu 2	Parameters
(System)	Depth Measurement		Auto, High Frequency, Low Frequency
	Sonic Correction		-7 to +2%
	Boat Speed Correction		-10 to +10
	Water Temp Correction		-10 to +10
	Speed Correction		-10 to +10
	Speed Data		INT, EXT
	Water Temp Data		INT, EXT
	EXT Trigger Type		OFF, ⌐‾, ¬_
	LANGUAGE		Japanese, English
Customize	GAIN Property		Linear, 8800 type ^{o}
	STC Property		Standard, 8800 type ^{o}
	Color Customize		000 - 255
	Panel Lock	GAIN (H) Knob	OFF, ON
		GAIN (L) Knob	OFF, ON
		ENHANCE (H) Knob	OFF, ON
		ENHANCE (L) Knob	OFF, ON
		STC AMPTD(H) Knob	OFF, ON
		STC AMPTD(L) Knob	OFF, ON
		STC DEPTH(H) Knob	OFF, ON
		STC DEPTH(L) Knob	OFF, ON
		RANGE Knob	OFF, ON
		MODE Knob	OFF, ON
		VRM Key	OFF, ON
		IMAGE SPEED Key	OFF, ON
		IR Key	OFF, ON
		SHIFT Key	OFF, ON
		COLOR REJ Key	OFF, ON
		ALARM Key	OFF, ON
		EVENT Key	OFF, ON
	Panel Brightness		1/5 - 5/5
Initialize	User Setting		1 - 4
	Factory Default		1 - 4
Simulator			OFF, ON

6.5 Descriptions of the menu functions

6.5.1 Transmission

6.5.1.1 Pulse Width (H) (L)

Definition and detectable depth of a sounder varies depending on the pulse width. The CVS-841/851 series sounder has 4 selectable pulse widths (Super Short, Short, Middle, Long) for High and Low frequencies. The characteristic of each pulse width is as follows:

Selections:

Super Short: Image definition is very good but detectable depth is extremely shortened.

Short: Image definition is good but detectable depth is shortened.

Middle: Image definition and detectable depth are improved compared with the Short".

Long: Detectable depth is lengthened.

Initial setting: Short

6.5.1.2 Output (Normal and Low)

This function increases or decreases the sounder power output in two steps, Normal and Low. In normal operation, this setting should be set to Normal (High level). In case the need is arisen to reduce the power, such as an inspection of acoustic power output, set the setting to Low (Low level).

Selections: Normal and Low

Initial setting: Normal

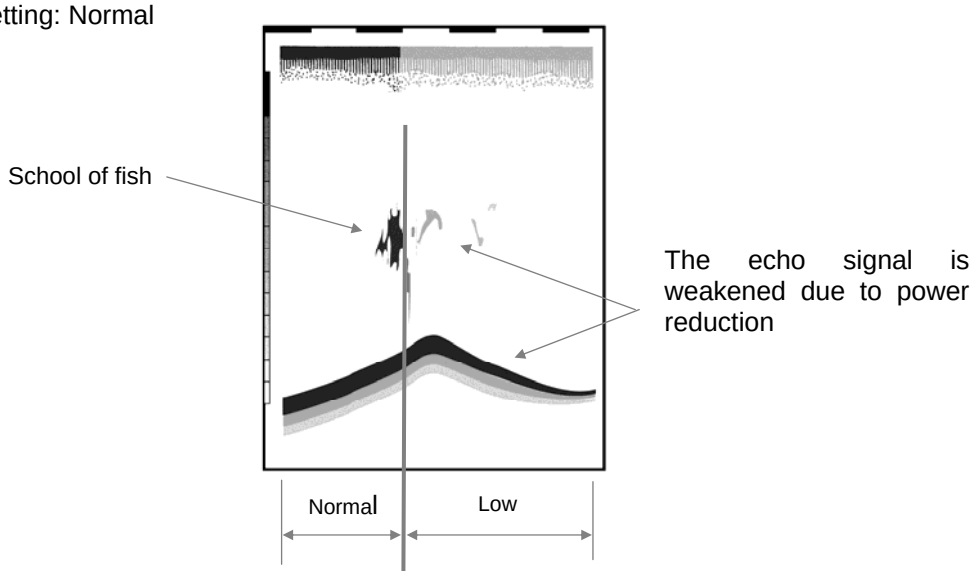


Figure 6.5 Reduction of output power

6.5.1.3 PRR (Pulse Repetition Rate)

This function changes the rate of transmission per minute. Using this function, you can eliminate the false echo caused by other sounder's transmission working on nearly the same transmission rate.

Selections: 1 (Fastest) – 10 (Slowest)

Initial setting: 1

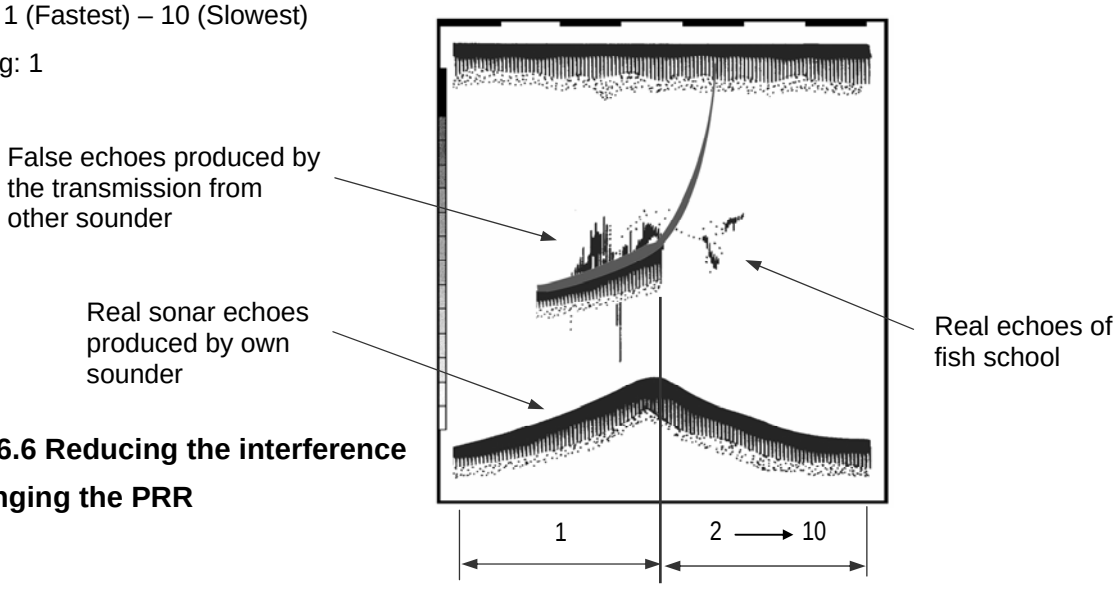

False echoes produced by the transmission from other sounder
Real sonar echoes produced by own sounder
Real echoes of fish school
1
2 → 10

Figure 6.6 Reducing the interference by changing the PRR

6.5.2 Image

6.5.2.1 Enhance

Enhances the picture presentation by changing the dynamic range of a sonar video in 5 steps. When you increase the number, the shades of colors are widened causing the echo density of fish and plankton to be well defined. When you decrease the number, the shades are narrowed causing the seabed and fish echoes may be displayed in predominant colors like red, orange and yellow.

Selections: 25、35、45、55、65

Initial setting: 25

To set up:

(1) Select the degree of the video enhancement in the sub menu.

(2) Turn the Enhance control (for High Frequency or Low Frequency) on the operation panel to a desired level.

6.5.2.2 Color tone

Varies the sonar color tone in 3 ways as follows.

Selections: 1, 2, 3 (steps)

1: 16 colors (KODEN standard color)

2: 16 colors (White not inclusive)

3: 8 colors (KODEN standard color)

Initial setting: 1

6.5.2.3 Background color

The background color of the screen can be changed in 9 ways.

Selections: 1 - 9

1 : Pale Blue, 2 : Marine Blue, 3 : Blue, 4 : Dark Blue, 5 : Black,

6 : Pale Greenish Blue, 7 : Greenish Blue, 8 : Dark Greenish Blue, 9 : White

Initial setting: 1

6.5.2.4 White Line

The white line is drawn on the edge of the seabed echo, to indicate a profile of the seabed. The thickness of the white line can be varied in 5 steps.

Selections: OFF, 1, 2, 3, 4, 5

1 (Fine) - 5 (Bold)

Initial setting: OFF

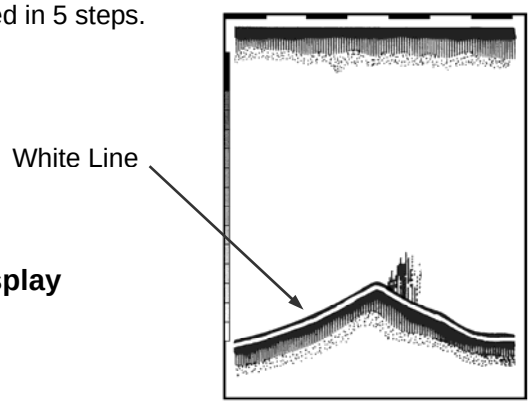


Figure 6.7 White Line display

6.5.2.5 Mix type

This mode of function enables quick and easy finding of small fish like young sardines utilizing the intrinsic nature of acoustic wave. As widely known, small fish are sensitive to the high frequency waves where the wavelength is closer to the length of the fish. Meanwhile, low frequency waves that have a longer wavelength produce small amount of echoes from small fish.

The image-mixing mode is an image processing function that enables weak fish like young sardines to be better defined by comparing or subtracting the images from both the HIGH and LOW frequencies. When echoes are detected by the HIGH frequency wave, the sounder displays these echoes in a pre-selected color to indicate small fish targets. The MIX function has three modes as, A (Comparison), B (Subtraction) and C (Selection).

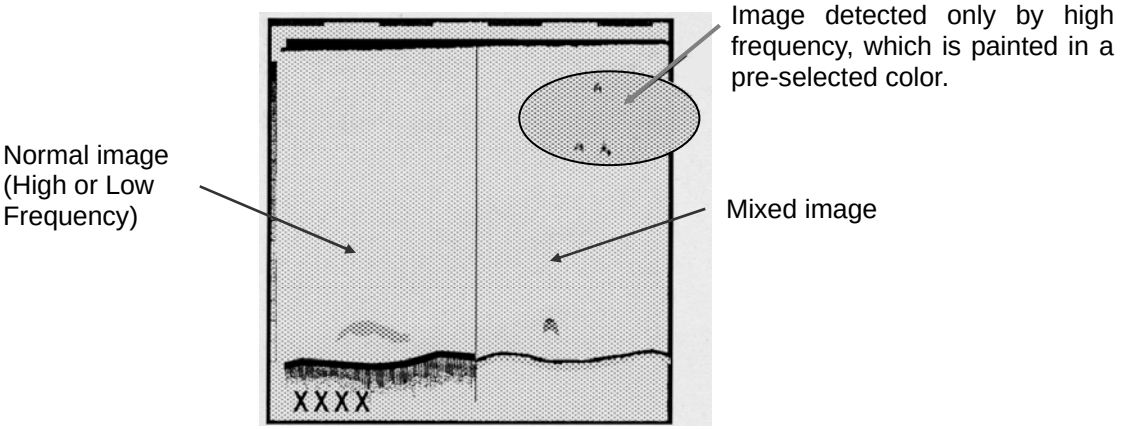


Image detected only by high frequency, which is painted in a pre-selected color.
Normal image (High or Low Frequency)
Mixed image
XXXX

Figure 6.8 Mixed image

A (COMPARISON) mode:

This mode displays the result of the comparison between HIGH and LOW frequency echoes. If those echoes are overlapped at the same depth, the resultant colors are displayed in mixed colors. However, if the HIGH frequency echo is painted in red (strongest color), the mixed color will also be red to show the echoes are from small fish. If the mixed fish school is partly displayed with mixed colors among red color, it suggests the possibility of a larger fish school among the small fish school.

B (SUBTRACTION) mode:

This mode displays the resultant image by subtracting the HIGH frequency echoes from those of LOW frequency. Using this method, you can discern a fish school by size. For instance, if the resultant echoes are displayed in similar colors as the HIGH frequency echoes, this result suggests the majority of the fish species is sensitive to the HIGH frequency transmission, i.e. the detected fish school could be small fish like young sardine. If the resultant echoes are shown in different colors from the HIGH frequency transmission, it indicates the fish school is sensitive to LOW frequency, therefore a larger size of fish species.

C (SELECTION) mode:

This method is similar to A mode in principle, however, the process in determining display color is different. If the High Frequency echo is predominant against those of Low Frequency, the resultant color is displayed in colors shown in High Frequency image. If the Low Frequency echoes are predominant against High Frequency in color presentation, no echo will be shown. This indicates there is few school of small fish.

Selection: A, B, C

A: Comparison

B: Subtraction

C: Selection

Initial setting: C

6.5.2.6 Flicker rejection

Rejects flicker on the screen while the screen is moving.

Selections: OFF and ON

Initial setting: ON

6.5.2.7 Past image

Enables gain control over past images shown on the screen. This feature allows the user to go back and analyze ground that has already been covered in greater detail including density of fish school, activity and even type of fish.

Selection: OFF and ON

Initial setting: ON

6.6 Display

6.6.1 A Scope

The A-Scope feature allows you to observe the wave shape of a fish echo, which may assist in discerning the characteristics type of the school of fish

Selections: ON, OFF

Initial setting: OFF

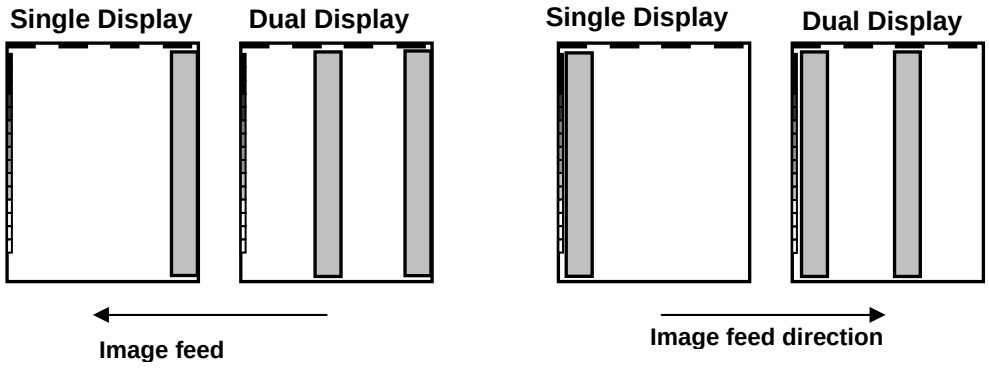


Figure 6.9 Position of the A-Scope display

6.6.2 Information Window

Displays a digital window in which the following information is shown: Own Ship's position, Event position, water temperature and ship's speed.

Selections: ON, OFF

Initial setting: OFF

NOTE 1: The Information Window feature is not available in CVS-841.

> ⚠ **CAUTION:** *The following external devices must be connected to display the information in the window: A navigation receiver that supplies the NMEA serial data for own ship position, event position and own ship's speed indications. A temperature/speed sensor (ST-80-1/90-1/100-1) that supplies water temperature and own ship's speed indications.*

6.6.3 Zoom type

BTM (Bottom)

The bottom image is always fixed in the lower part of the screen even though the depth changes.

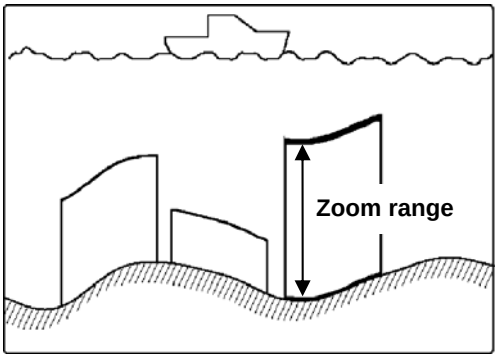


Figure 6.10 Layout of BTM image display

BD (Bottom Discrimination)

Even though the sea bottom depth changes, the top surface of the sea bottom is displayed as a flat surface in order to serve as a reference. A range of measurement is also taken underneath the reference.

This results in being able to distinguish school of fish and bottom quality that may be at the sea bottom.

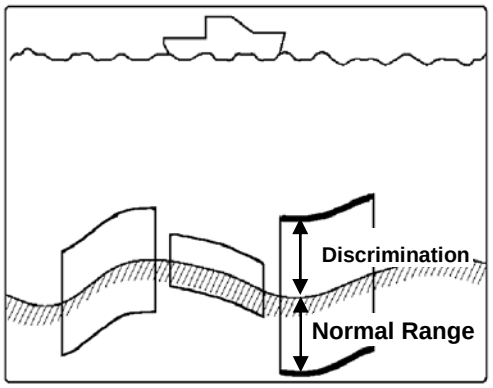


Figure 6.11 Layout of BD image display

ZOOM(Zoom)

A zoomed image is shown in reference to a specified depth. In this mode, the seabed echoes are always shown even when the depth changes.

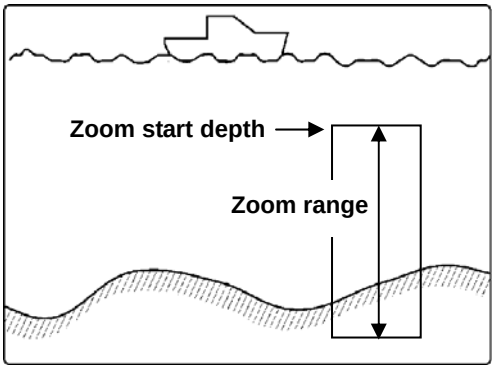


Figure 6.12 Layout of ZOOM image display

B.Z (Bottom Zoom)

Bottom image can be zoomed with reference to the seabed. Equally spaced depth markers are shown in a solid line.

Selections: BTM, BD, ZOOM, B.Z.

Initial setting: BTM

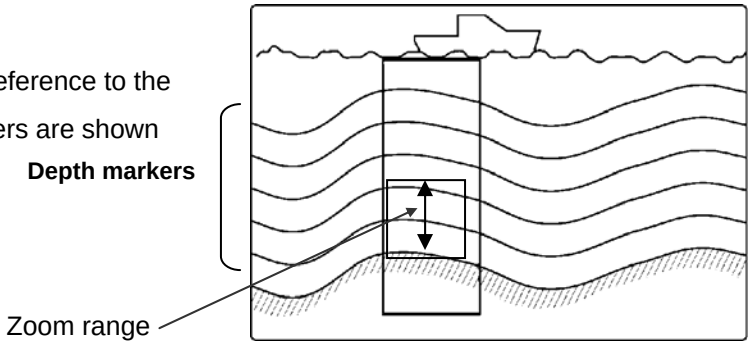


Figure 6.13 B.Z image display

6.6.4 Zoom range

Selects the zooming range of a zoomed mode, BTM, BD, ZOOM and B.Z. Available zoom ranges differ according to the depth unit selected.

Selections:

For meter, hiro, fathom, Italian fathom:
2.5, 5, 7.5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 180, 200

Initial setting: 2.5

For feet:
10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 320, 360, 400, 450, 500, 550, 600, 650

Initial setting: 5

6.6.5 User settings, USER 1 – User 2

User specific settings can be allocated to USER 1 and USER 2 functions. The following image mode can be allocated to these functions:

Selections:

H/MIX, L/MIX, H/L/MIX, H/EN, L/EN, H/BTM/L/BTM, H/B.D.L/B.D., H/ZOOM/L/ZOOM, H/B.Z/L/B.Z

Initial setting: USER 1: H/BTM L/BTM, USER 2: H/B.D. L/B.D.

6.6.6 User settings, USER 3

The 3-Division screen can be allocated to USER 3 function.

Selections:H(1)/H(2)/L, H(2)/H(1)/L, L/H(1)/H(2), L/H(2)/H(1), H(1)/L/H(2), H(2)/L/H(1)

Initial setting: H(1)/H(2)/L

6.6.7 Depth value

Selects the text size of a depth indication on the screen.

Selections: OFF、Large, Middle, Small

Initial setting: Large

6.6.8 Depth value position

Sets up the position of the digital depth indication on top or bottom of the screen.

Selections: Bottom, Top

Initial setting: Bottom

6.6.9 Scale

Sets up the position of the depth scale on the screen. The choices are; a single scale display shown at the right hand side of a single or dual screen or; dual scale displays shown in the left hand side of each screen.

Selections: OFF, Single, All

Initial setting: Single

6.6.10 Scale position

Sets up the horizontal position of the depth scale on the screen, right hand side or the center.

Selections: Side, Center

Initial setting: Side

6.6.11 Scale value

Selects the size of the depth scale value.

Selection: Large, Small

Initial setting: Small

6.6.12 Time Mark

Selects the time marker on or off or time unit (every 10 seconds, 1 minute).

Selections: OFF, 10 sec, 1 min

Initial setting: 10 sec

6.6.13 Image direction

Selects the direction of image movement.

Selections: ← | ← , → | ← , → | →

Initial setting: ← | ←

6.6.14 Image partition

Selects the image split way, either in a vertical split or a horizontal split..

Selections: Vertical, Horizontal

Initial setting: ▯▯ (Vertical)

> **CAUTION:** *This function is not available when the image is split to 3 sections.*

6.6.15 Image swap

This function allows swapping of the dual image display left side right, or up side down.

Selections: A|B, B|A

Initial setting: A|B

6.6.16 Color Bar scale

Turns on or off color bar scale, which is shown on the left side of the screen.

Selections: ON, OFF

Initial setting: ON

6.6.17 Present position

Turns on or off the boat position display (position display in latitude/longitude or LOP).

Selections: OFF, L/L, LOP

Initial setting: OFF

6.6.18 Boat speed

Turns on or off your boat speed and selects its unit.

Selections: OFF, kt, kmh, mph

Initial setting: OFF

6.6.19 Bearing

Turns on or off the bearing of your boat.

Selections: OFF, ON

Initial setting: OFF

6.6.20 Water Temp

Turns on or off water temperature and selects its unit.

Selections: OFF, ^{o}C, ^{o}F

Initial setting: OFF

6.6.21 Water Temp graph

Turns on or off the water temperature graph. To use this function, an appropriate water temperature sensor must be connected to the CVS-842/852 sounder.

Selections: OFF, ON

Initial setting: OFF

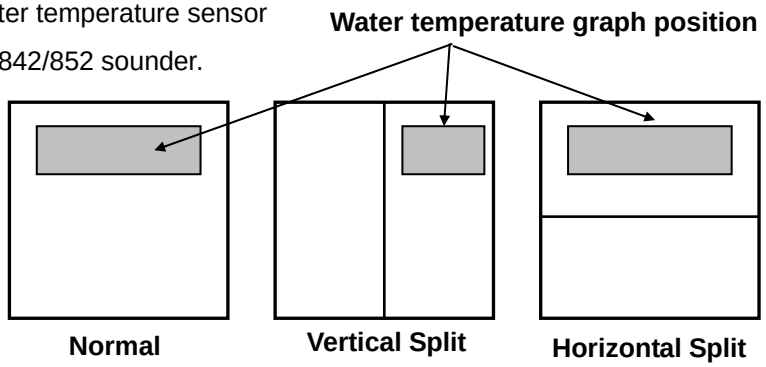


Figure 6.14 Available positions of Water Temperature Graph

6.6.22 Event position

Turns on or off the Event position display and selects its unit in latitude/longitude or LOP (Time Difference). In case the Boat Position is set to OFF, the Event position is displayed in latitude/longitude.

Selections: ON, OFF

Initial setting: OFF

6.6.23 Event distance

Turns on or off the Event distance display and selects its unit from nm, km, or sm. In case the Boat Speed is set to OFF, the distance to Event is displayed in nm.

Selections: OFF, ON

Initial setting: OFF

6.6.24 Event direction

Turns on or off the direction of Event to own ship.

Selections: OFF, ON

Initial setting: OFF

6.6.25 Event elapsed time

Turns on or off the time elapsed from Event position.

Selections: OFF, ON

Initial setting: OFF

6.7 Automatic (functions)

There are two auto functions available for range selection or depth shift control:

Selections: Auto Range, Auto Shift

6.7.1 Auto range

Displays an entire sonar echo of varying depth by automatically phasing the sounding range. The image is referenced to the surface of the sea as shown in Figure 6.16.

Selections: OFF, ON

Initial setting: OFF

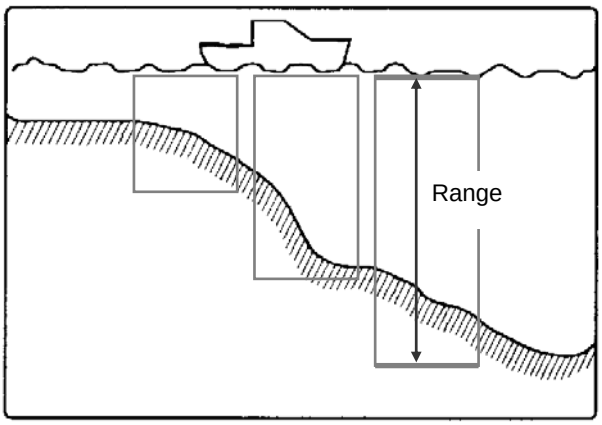


Figure 6.15 Auto Range display

6.7.2 Auto shift

Displays a seabed echo of varying depth within the screen. When the seabed depth becomes shallower than 40% or, deeper than 90% of the full depth scale, the entire image will be reset to 65% of the scale, keeping the seabed echo always shown within the screen.

Selections: OFF, ON

Initial setting: OFF

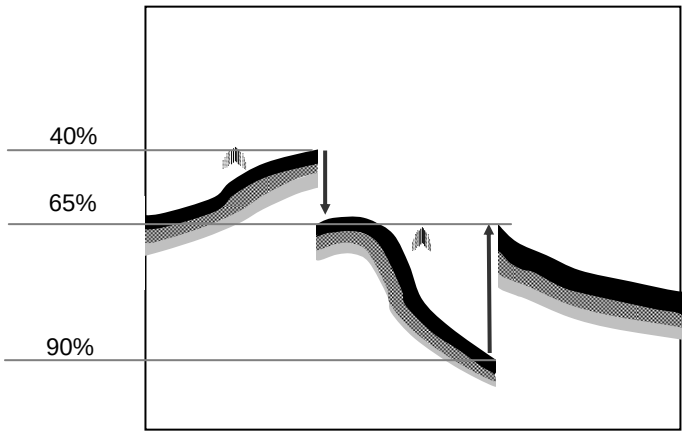


Figure 6.16 Auto Shift display

6.8 System

6.8.1 Time

Adjusts the time of the internal clock. In case the RMC sentence of NMEA 0183 is supplied from a navigation receiver, current time is automatically displayed without the need of settings.

Setting items: Year, Month, Day, Hour, Min, and Sec.

Initial setting: 2001/01/01 00:00:00

6.8.2 Depth unit

Selects the depth unit of measure from the following options:

Selections: m, fm, J.fm, l.fm, ft

Initial setting: m

6.8.3 Depth range preset

The following depth range values are registered depending on the depth unit.

(1) **For meter, hiro, fathom, Italian fathom**

(Applicable to all models)

2.5, 5, 7.5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65,70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 280, 290, 300, 310, 320, 330, 340, 350, 360, 370, 380, 390, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1100, 1200

(Additional range values for 3kW models)

1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000

(2) **For feet**
(Applicable to all models)
10, 15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 440, 480, 520, 560, 600, 640, 680, 720, 760, 800, 840, 880, 920, 960, 1000, 1040, 1080, 1120, 1160, 1200, 1240, 1280, 1320, 1360, 1400, 1440, 1480, 1520, 1560, 1600, 1800, 2000, 2200, 2400, 2600, 2800, 3000, 3200, 3400, 3600, 3800, 4000

(Additional range values for 3 kW models)
4200, 4400, 4600, 4800, 5000, 5200, 5400, 5600, 5800, 6000, 6200, 6400, 6800, 7000, 7200, 7600, 8000

Initials setting: Refer to the Annex A2.2.3 “Depth Range Preset default values”

6.8.4 Draft setting

Sets up the depth of the draft line. By doing so, the seabed depth is displayed as the depth from the sea surface.

Selections: 0.0 to 25.5 (applicable to all depth units)

Initial setting: 0.0

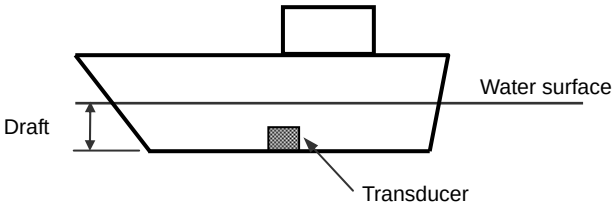


Figure 6.17 Draft Line

6.8.5 Bottom start

Sets up the starting depth of the seabed detection. Once set, the fish echo or the seabed shallower than the set up depth will not be detected.

Selections: 0 - 20.0 (Applicable to all depth units)

Initial setting: 5.0

6.8.6 Bottom detection

Sets up the bottom detection area within or outside of the screen display.

Selections: Inside Range, Outside Range

Initial setting: Inside Range

6.8.7 Bottom detection adjust

Sets up the threshold of detection for bottom echo signal.

Selections: -80 to +40

Initial setting: -40

6.8.8 Depth measurement

Selects the method for depth measurement, which is shown on the screen.

Selections: Auto, High Frequency, Low Frequency

Initials setting: Auto

6.8.9 Sonic correction

Corrects the depth indicator value to a known true value. A depth indication may deviate from a true value because of the water temperature difference or salt concentration in the water. This setting compensates such deviation.

Selections: -7 to +2%

Initial setting: 0 %

6.8.10 Water Temp correction

Compensates the deviation of a temperature value supplied from the speed/temperature sensor (ST-80-1, ST-90-1 or ST-100-1)

Selections: -10.0 to +10.0

Initial setting: 0.0

6.8.11 Boat Speed correction

Compensates the deviation of a boat speed value supplied from the speed/temperature sensor (ST-80-1, ST-90-1 or ST-100-1)

Selections: -10.0 to +10.0

Initial setting: 0.0

6.8.12 Speed data

Displays the boat speed data supplied from a speed sensor. The speed sensor can be supplied from a dedicated temperature/speed sensor or from a navigation receiver via the connector described below.

INT: This connector is used when the speed data is taken from a dedicated speed sensor (ST-80-1/90-1/100-1). When no data is supplied, “0.0” will be shown in the speed data window.

EXT: This connector is used when the speed data is supplied from an external sensor or navigation receiver in NMEA format. When no data is supplied, “xxx.x” will be shown in the speed data window. (NOTE: The data format must be NMEA 0183 ver1.5 or 2.0)

Selections: INT, EXT

Initial setting: EXT

6.8.13 Water Temp data

Displays the temperature data supplied from a water temperature sensor or a navigation receiver that supplies NMEA 0183 data. Select INT or EXT in the Water Temp Data sub menu for available sensor or NMEA data.

INT: Selects KODEN water temperature sensor ST-80-1/90-1/100-1. In case no water temperature data is supplied, “0.0” will be displayed in the water temperature digital window.

EXT: Selects NMEA 0183 ver. 1.5 or 2.0 serial data supplied from a navigation receiver. In case no

temperature data is supplied, “xxx.x” will be shown in the water temperature digital window.

Selection: INT, EXT

Initial setting: EXT

6.8.14 EXT Trigger type

Selects the external trigger pulse polarity.

Selections: OFF/ ⎍ (Triggered on the leading edge) / ⎏ (Triggered on the trailing edge)

Selections:

OFF : No external sounder to be connected

⎍ : Selects a positive sync trigger supplied from an external sounder.

⎏ : Selects a negative sync trigger supplied from an external sounder.

Initial setting: OFF

6.8.15 Language

Selects the screen language.

Selections: Japanese, English

Initial setting: English

6.9 Customize

The following sub menus are available:

6.9.1 GAIN property

Selects the receiver gain characteristic according to your fishing type, type of fish, etc. Available characteristics are Linear type and 8800 type (Logarithmic law).

Linear type: The receiver gain varies in a linear law in proportion to the Gain control, best suited to shallow water fishing or detecting weak echoing school of fish.

“8800” type: The receiver gain varies in a logarithmic law, rapid in change at the beginning and slow afterwards. This property is useful in deep sea fishing to locate school of fish and the species.

Selections: Linear, 8800

Initial setting: 8800 type

6.9.2 STC property

STC is an abbreviation of Sensitivity Time Control, which is used to reduce weak echoes such as plankton, floating marine plants, etc. near the sea surface in order to view a school of fish in good clarity. The rate of sensitivity reduction can be selected from Linear or 8800 (Log) type.

Selections: Linear, 8800 type ^{o}

Initial setting: Standard

6.9.3 Color customize

All colors used on the screen can be customized to your preference. There are 256 color palettes available in total. Each palette has Red, Green and Blue sub palettes with 256 color tones available.

6.9.4 Panel lock

Disables the functions of controls and keys to avoid deviation of these settings by unintentionally touching them during operation. This functions is applicable to all controls and keys on the operation panel.

Initial setting: All OFF

> ⚠ **CAUTION:** *The MENU key and the four way arrow keys cannot be function-locked.*

6.9.5 Panel brilliance

Controls the brilliance of the operation panel.

Selections: 1/5 (Brightest) to 5/5 (Darkest)

Initial setting: 5/5

6.10 Initialize

6.10.1 User setting

This sub menu is used to register the menu-driven functions specified by the user to internal registers, named User 1 through to User 4.

To register:

(1) Press the up or down arrow key to select User Setting and then select User Setting 1, for example.

(2) Press the right arrow key to select “Registration” => “Execute” and then press the right arrow key. The menu display disappears and now user defined menu functions are registered to the User Setting 1 register.

To delete:

(1) Press the right arrow key to select “Registration” => “Clear” and further press the right arrow key. The menu display disappears and now user defined menu functions are deleted from the User Setting 1 register.

6.10.2 Factory default

This sub menu is used to initialize the system to a factory default, Factory Default 1, 2, 3 or Default 4.

> ⚠ **CAUTION:** *Record all current settings before implementing the above functions.*

To do so:

(1) Select a Factory Default Number (1, 2, 3, or 4) and press the right arrow key. The Factory Default sub menu (Factory Default 1, 2, 3, 4) appears.
(2) Press the down arrow key to select “Execute”.
(3) Press the left arrow key to fix the selection. The menu display disappears and the system is now set to the selected Factory Default.
(4) To change the setting, repeat the above procedures from step (1).

6.11 Simulator

Displays simulated sonar echoes for training and exhibition purposes of CVS-841/851 series sounder. To display the simulated echoes, select ON and exit the menu. To turn off the Simulator, select OFF and exit the menu.

Selections: OFF, ON

Initial setting: OFF

CAUTION: *The following functions are not available in Simulator mode: Power On/Off, STC Draft.*

Chapter 7 Functional Registration

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Chapter 7 Functional Registration

This chapter describes the procedures to register the user defined functional parameters to the Range and MODE switches. The items that can be registered are as follows:

(1) Depth ranges

(2) Display modes (USER 1, USER 2 and USER 3 and Zoom)

7.1 Depth range registration

This procedure is used to register the sounding depth to each range number shown on the operating panel around the range selection switch. To register:

(1) Press the MENU key to display the main menu.

(2) Press the up or down arrow key to highlight SYSTEM and press the right key to show the SYSTEM sub menu.

(3) Press the up or down key to highlight DEPTH RANGE PRESET and press the right arrow key to show the range registration list.

(4) Press the up or down arrow key to select the range number.

(5) Press the right arrow key to show the range number window.

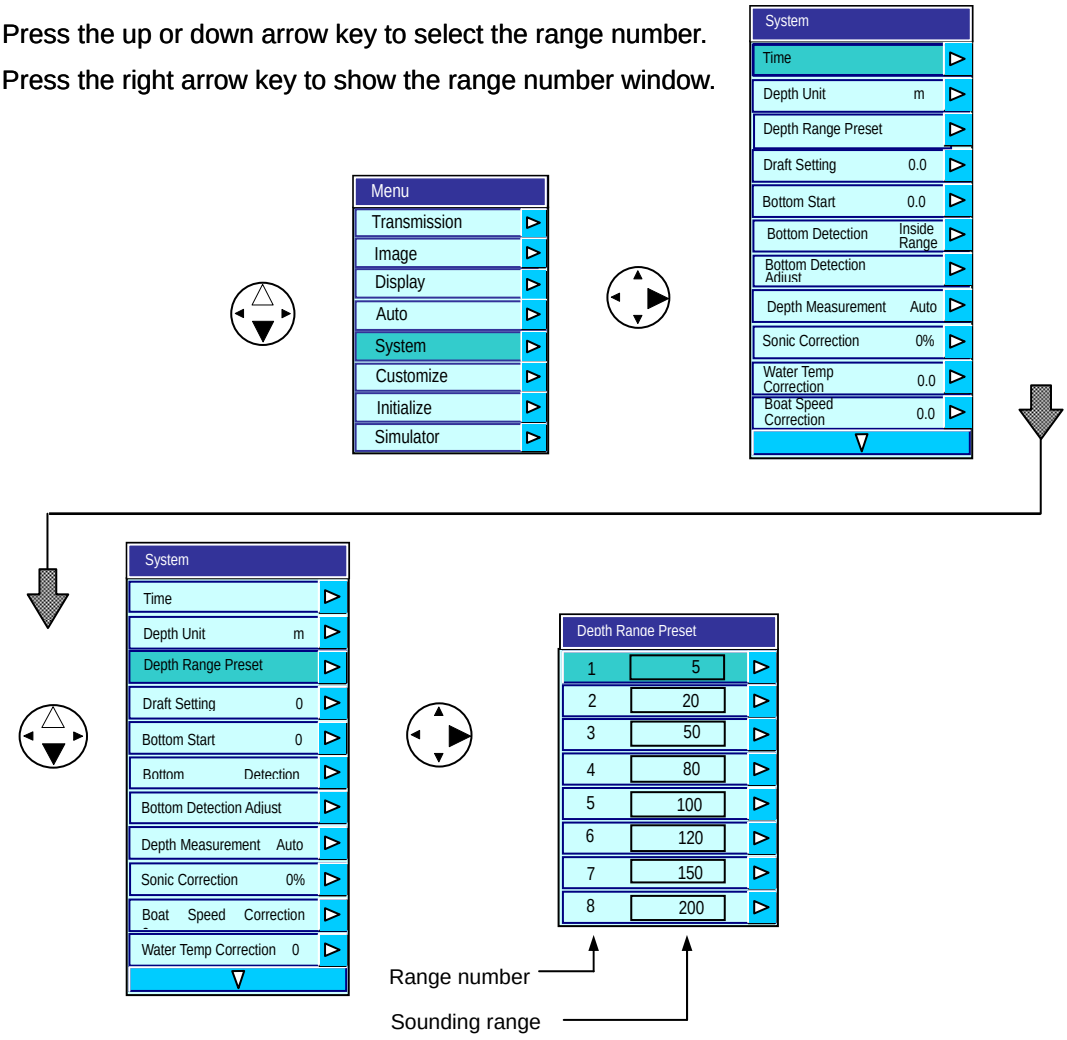


Figure 7.1 Depth range registration (1)

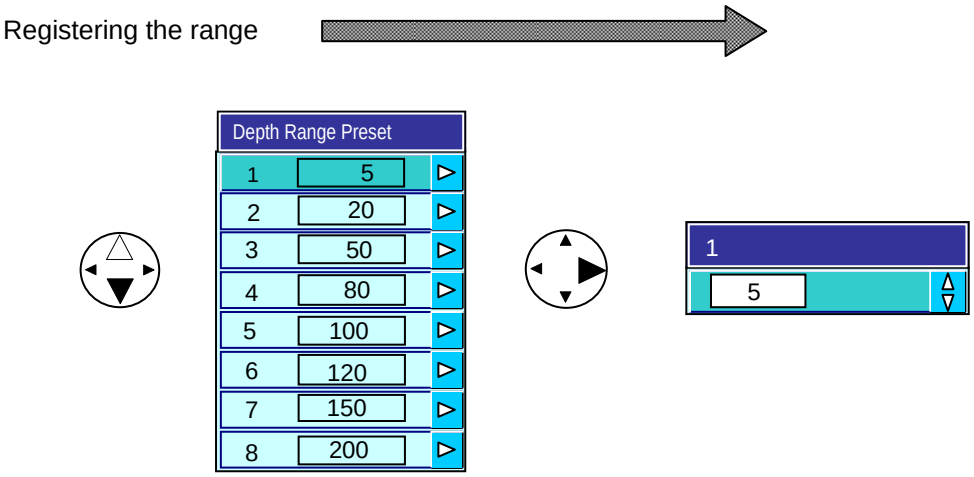


Figure 7.2 Depth range registration (2)

(6) Press the up or down arrow key to select the depth range.

(7) Press the MENU or left arrow key to return to Depth Range Preset sub menu for other depth range registeration. The registered value will be shown in the DEPTH RANGE REGISTERED menu.

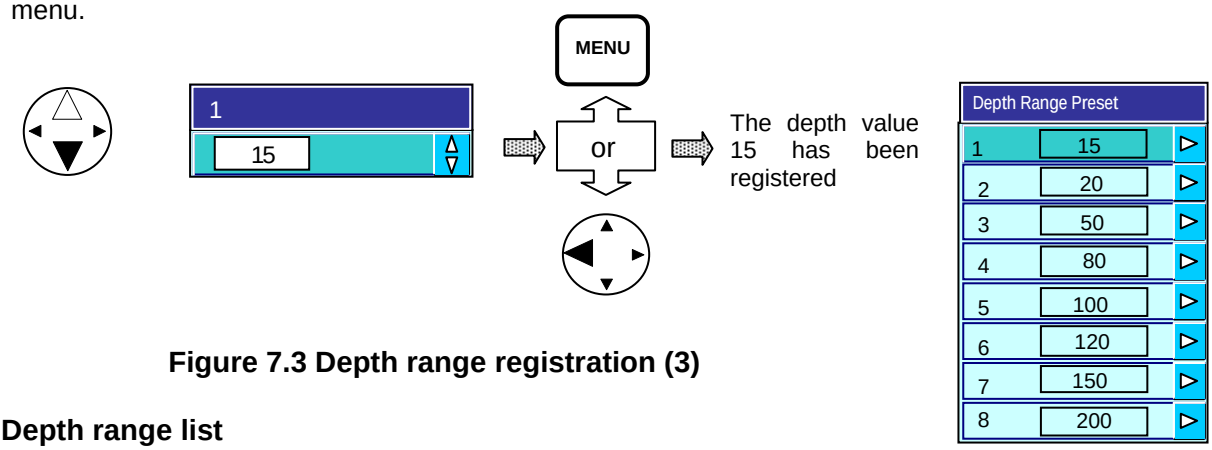


Figure 7.3 Depth range registration (3)

Depth range list

(1) <u>For meter, hiro, fathom, Italian fathom</u>
(Applicablt to all models)
2.5,5,7.5,10,15,20,25,30,35,40,45,50,55,60,65,70,75,80,85,90,95,100,110,120,130,140,150,160,170,180,190,200,210,220,230,240,250,260,280,290,300,310,320,330,340,350,360,370,380,390,400,450,500,550,600,650,700,750,800,850,900,950,1000,1100,1200

(Additional ranges for 3kW models)
1300,1400,1500,1600,1700,1800,1900,2000,2100,2200,2300,2400,2500,2600,2700,2800,2900,3000

(2) <u>For feet</u>
(Applicable to all models)
20,40,60,80,100,120,140,160,180,200,220,240,260,280,300,320,340,360,380,400,440,480,520,560,600,640,680,720,760,800,840,880,920,960,1000,1040,1080,1120,1160,1200,1240,1280,1320,1360,1400,1440,1480,1520,1560,1600,1800,2000,2200,2400,2600,2800,3000,3200,3400,3600,3800,4000

(Additional ranges for 3kW models)
4200,4400,4600,4800,5000,5200,5400,5600,5800,6000,6200,6400,6600,6800,7000,7200,7600,8000

(8) Repeat the above procedures to register other depth ranges to each range number.

(9) To exit from the menu press the MENU key or the left arrow key in the following sequence.

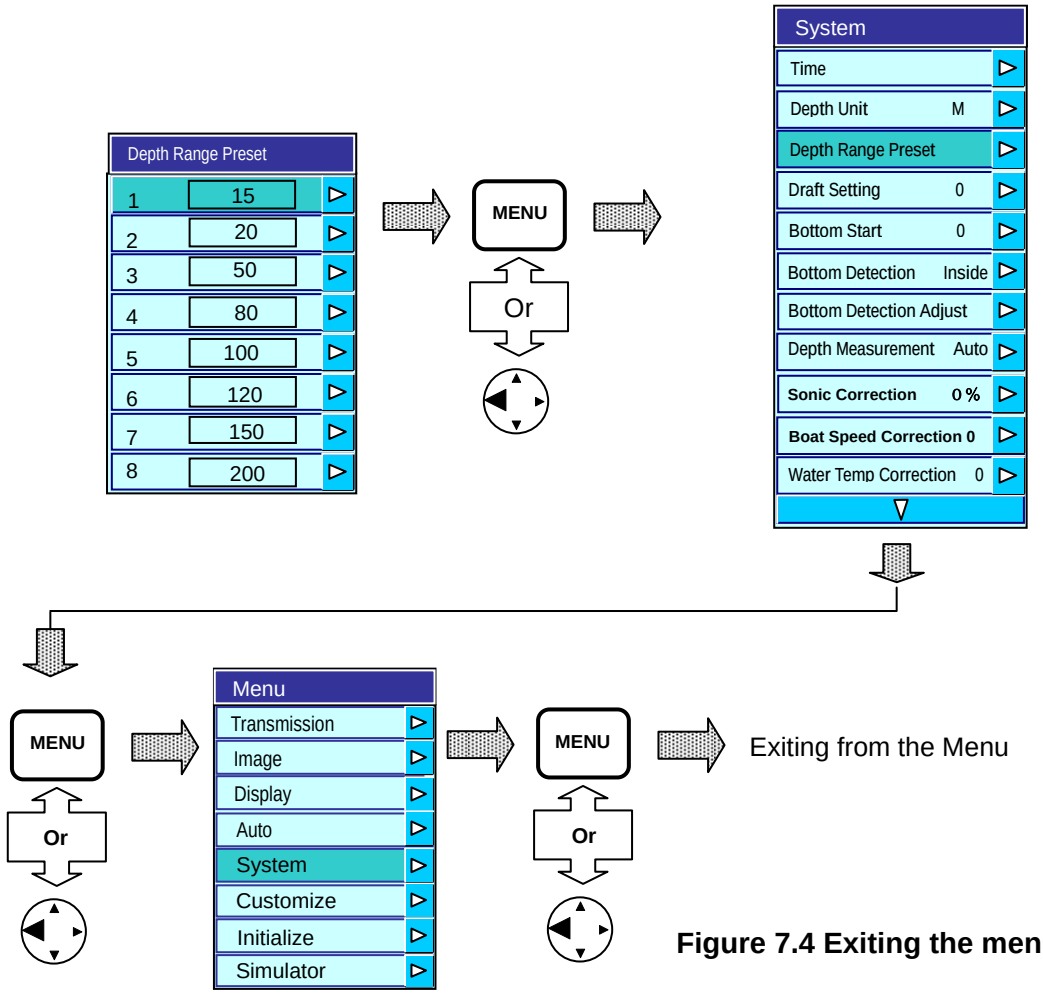


Figure 7.4 Exiting the menu

The SYSTEM menu has 2 pages of the sub menu, each one can be selected by pressing the down or up arrow key.

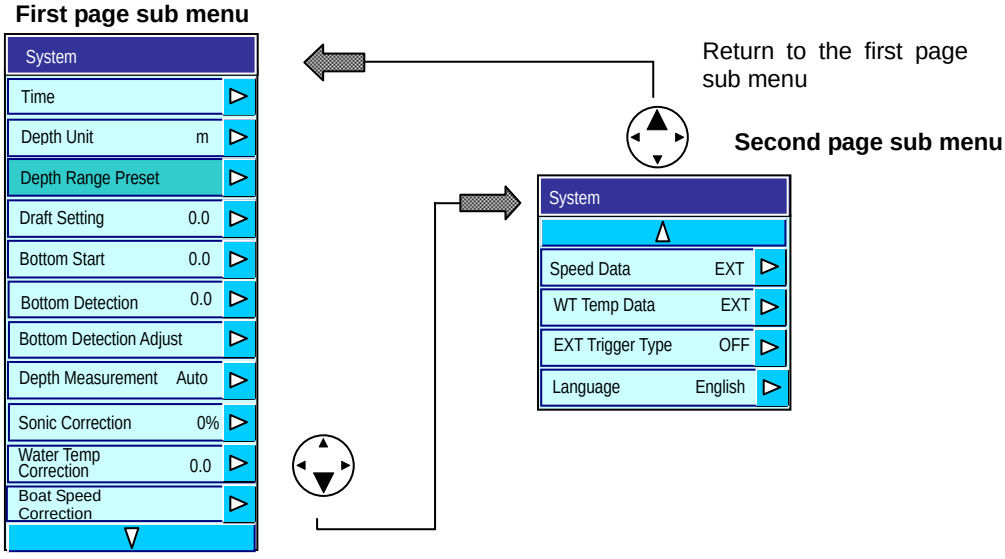


Figure 7.4 Scrolling the SYSTEM menu

7.2 Display mode registration

7.2.1 Registering functions to USER 1 and 2

(1) Press the MENU key to display the main menu.

(2) Press the down arrow key to highlight DISPLAY.

(3) Press the right arrow key to show the DISPLAY sub menu list. Pressing the down arrow key scrolls 3 pages of the sub menu as shown below.

(4) Press the up or down arrow key to select USER 1, for instance.

(5) Press the right arrow key to display USER 1 sub menu.

(6) Press the up or down arrow key to select the item, H/EN (Enhance) for example.

Menu => Display => User 1 (User 2) =. H/EN

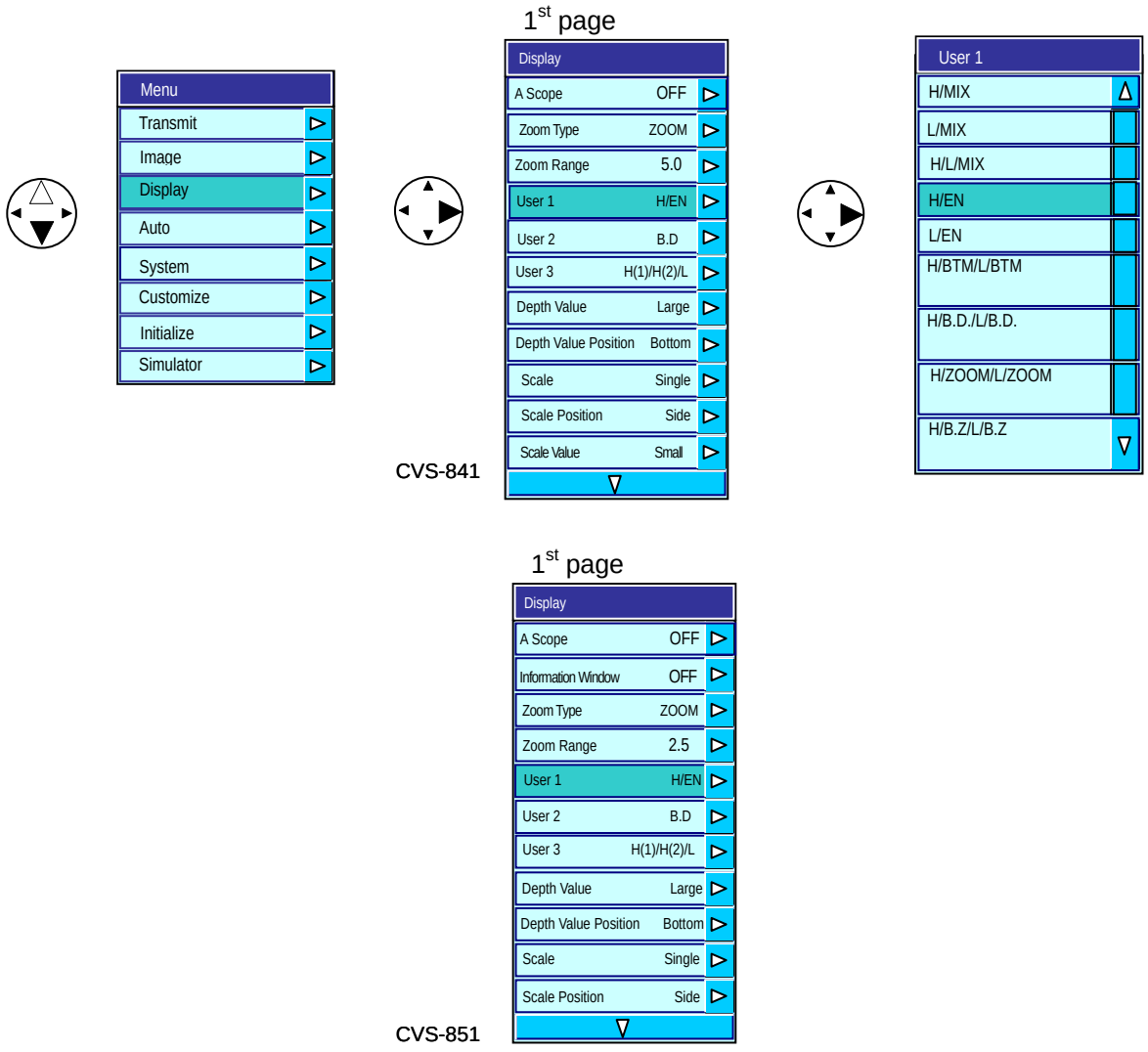


Figure 7.5 function registration to USER 1 - 2

The items and their image arrangements available in the USER 1 menu are as follows:

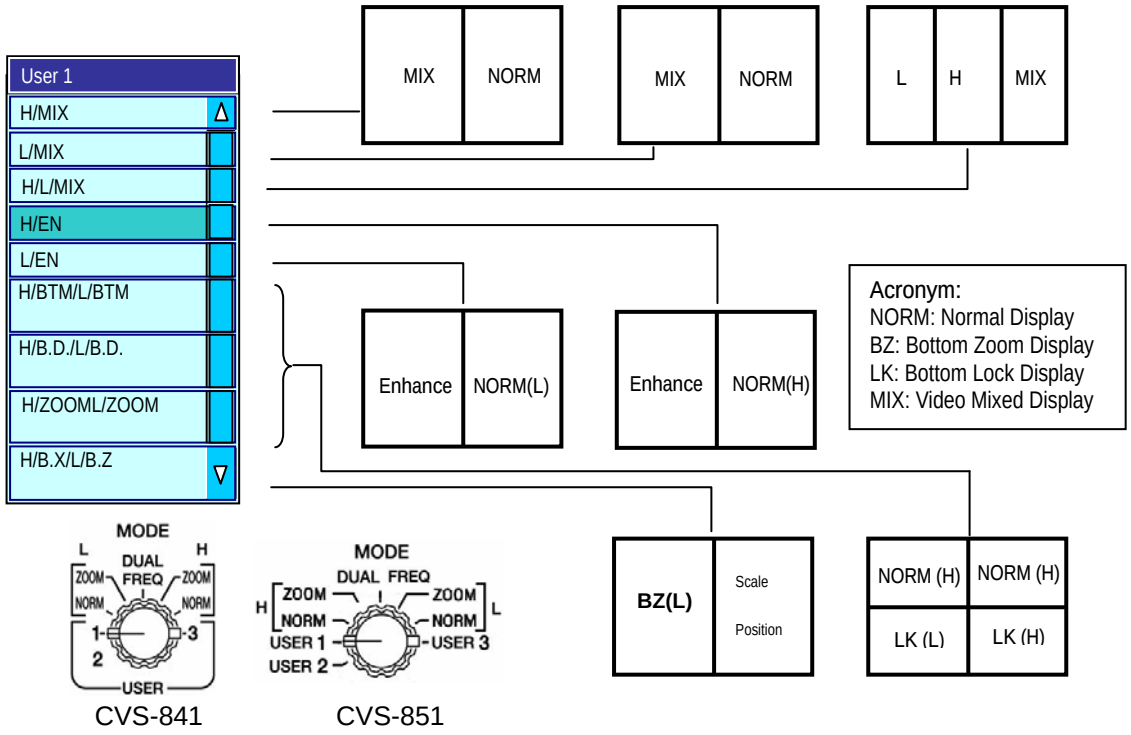


Figure 7.6 Available image modes in the USER 1 menu

(7) Press the MENU key or the left arrow key to fix the H/Enhance (See NOTE) selection. The display will return to an upper level menu, showing USER 1 H/Enhance under the DISPLAY menu.

NOTE: The H/Enhance function is defaulted to 25 dB. To change the setting, refer to Para 7.5 “Setting the Enhance effect”.

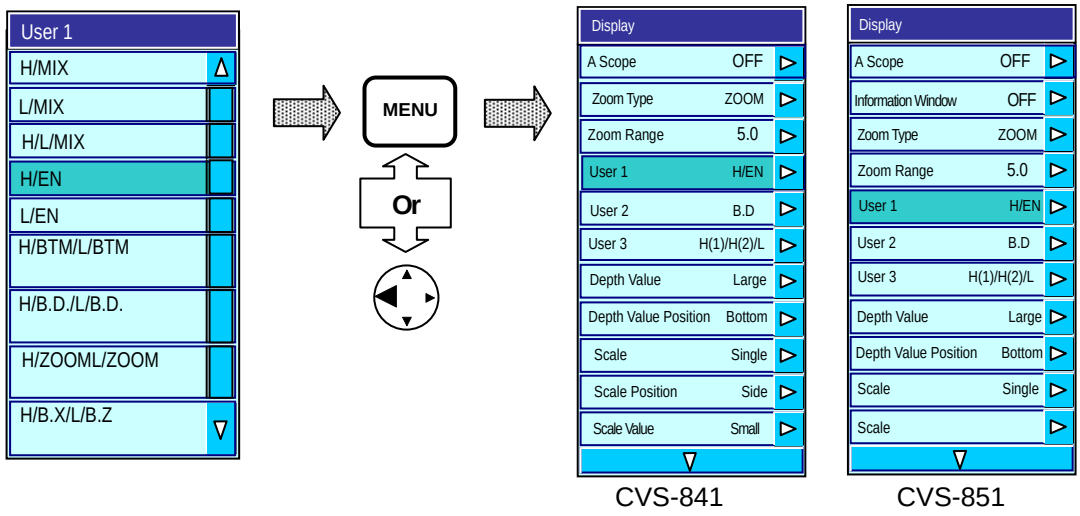


Figure 7.7 Fixing the entry to the USER 1 menu

(8) To continue the settings for USER 2 , repeat the procedure from step (3).

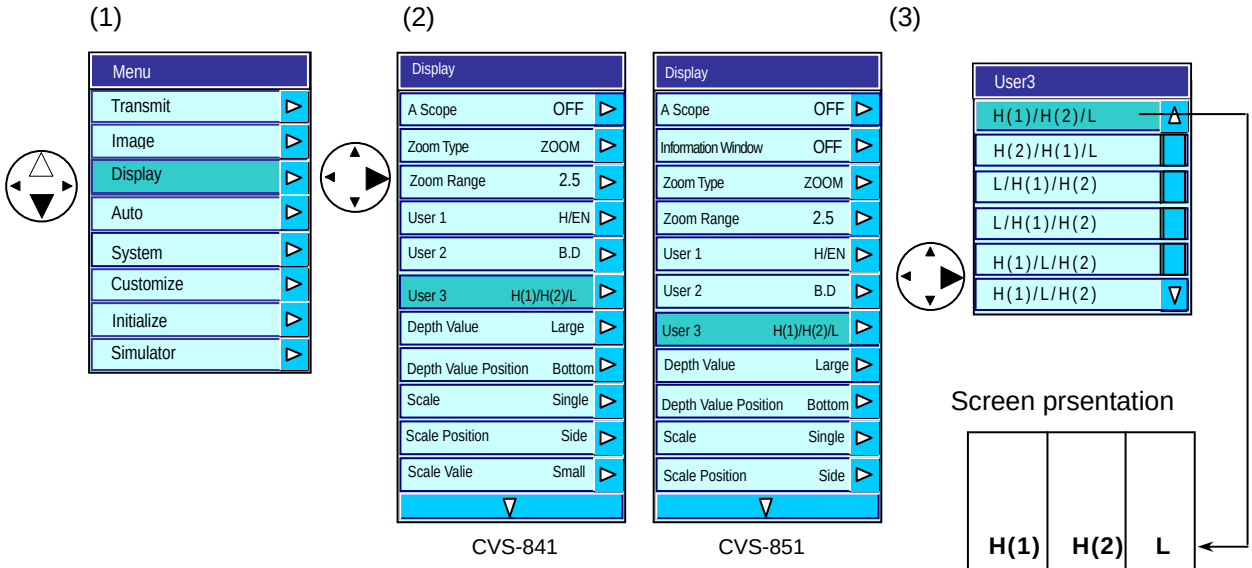
(9) To exit this menu, press the MENU key or the left arrow key twice.

7.2.2 Registering functions to USER 3

(1) Press the MENU key to display the menu.

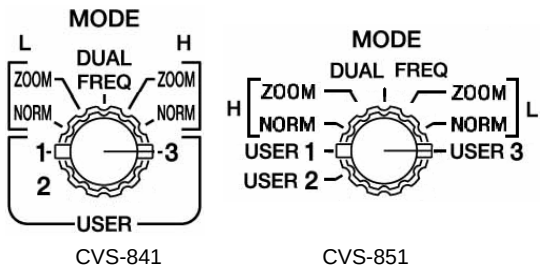
(2) Press the right arrow key to select User 3.

(3) Further press the right arrow key to display the User 3 selection window.



The image mode settings

Set the MODE switch as shown below to select USER 3.



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(4) This completes the image mode settings.

7.2.3 Registering a ZOOM type

There are four types of the zoomed image, BTM, BD, ZOOM and B.Z. which can be applied to ZOOM mode, selected by the MODE switch.

The abbreviations of these terms are as follows:

BTM：Bottom Lock (Dual screen)

BD: Bottom Discrimination (Dual screen)

ZOOM: Zoom (Dual screen)

B.Z. Bottom Zoom (Single screen)

To select an item:

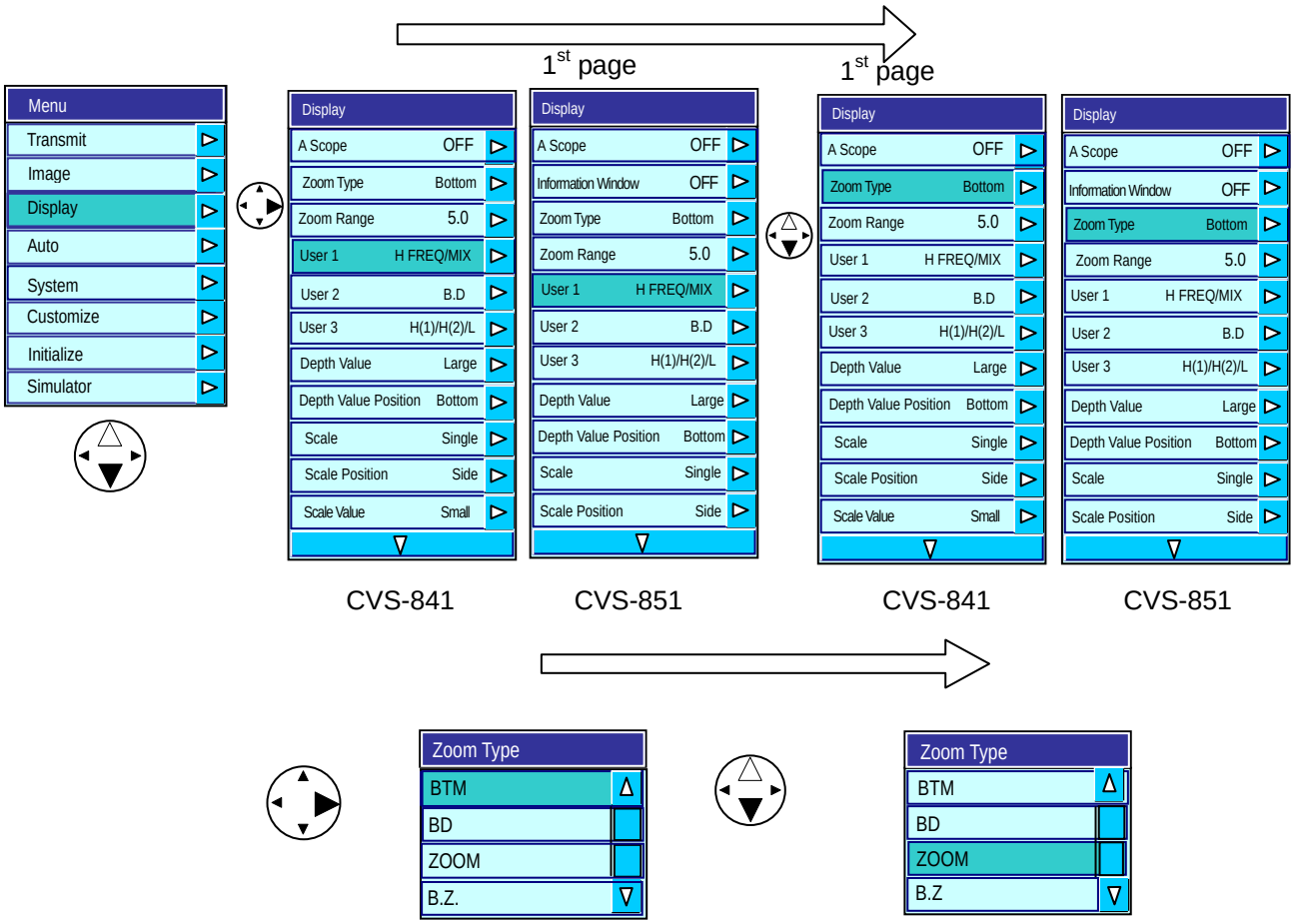
(1) Press the MENU key to display the main menu list.

(2) Press the up or down arrow key to highlight the Display item and press the right arrow key. The Display Type sub menu will appear.

(3) Press the up or down arrow key to highlight Zoom Type and press the right arrow key. The Zoom Type sub menu will appear.

(4) Press the up or down arrow key to highlight a Zoom Type (ZOOM is selected in this example).

Main Menu => Display => User 1 => Zoom Type

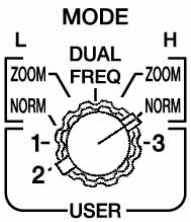


The screen layout of available zoom mode displays are as follows:

Figure 7.8 Registering a ZOOM type

[For High Frequency settings]

Mode switch setting



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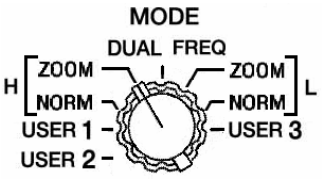

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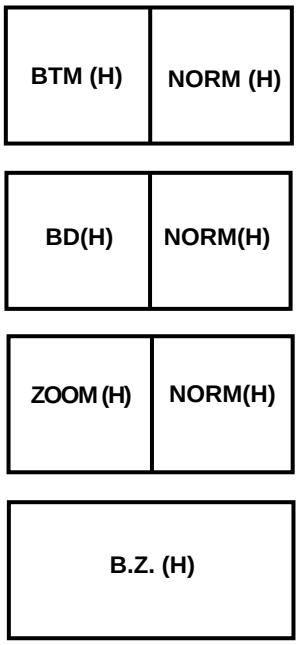
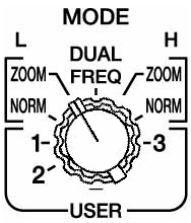
Available Image Layout



[For Low Frequency settings]

Mode switch setting



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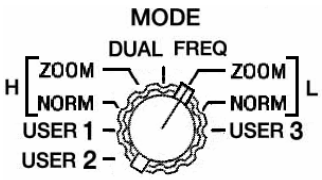

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Available Image Layout

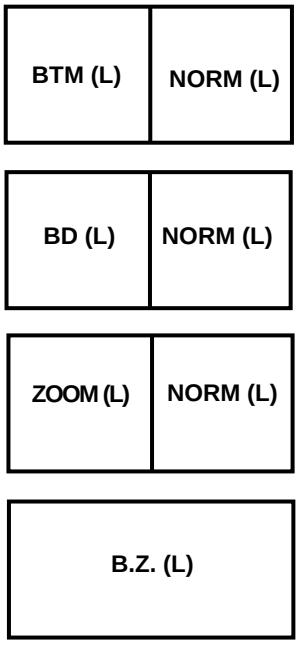


Figure 7.9 Available ZOOM mode screen layout

7.2.3.1 BTM/NORM display

This mode of image is a combination of normal and BTM (Bottom Zoom) images. In the BTM image, the seabed echo is shown flat and fixed to the bottom of the screen with fish echoes shown within the depth specified by the user.

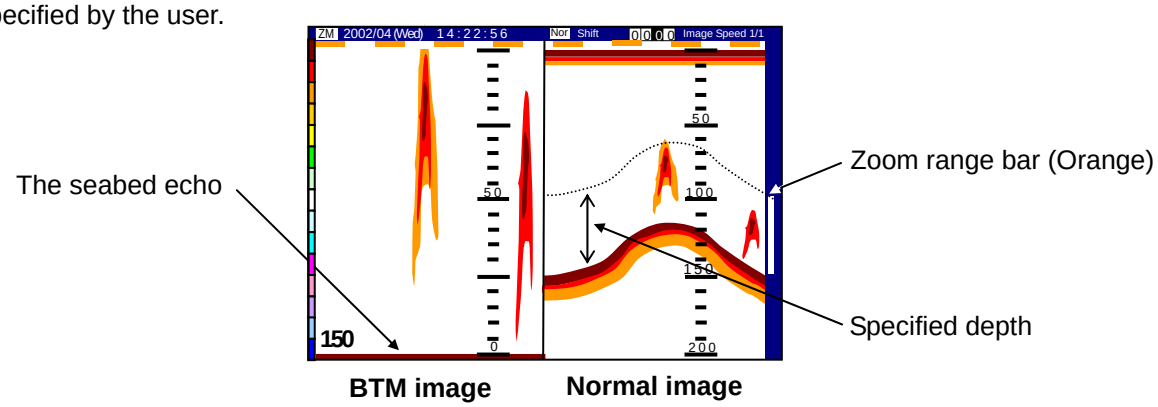


Figure 7.10 BTM/NORM display screen layout

7.2.3.2 BD/NORM display

This mode of image is a combination of normal and BD (Bottom Discrimination) images. In the BD image, the seabed image is shown flat with its upper and lower parts shown at a specified depth. The fish echoes are shown within the range set up by the user.

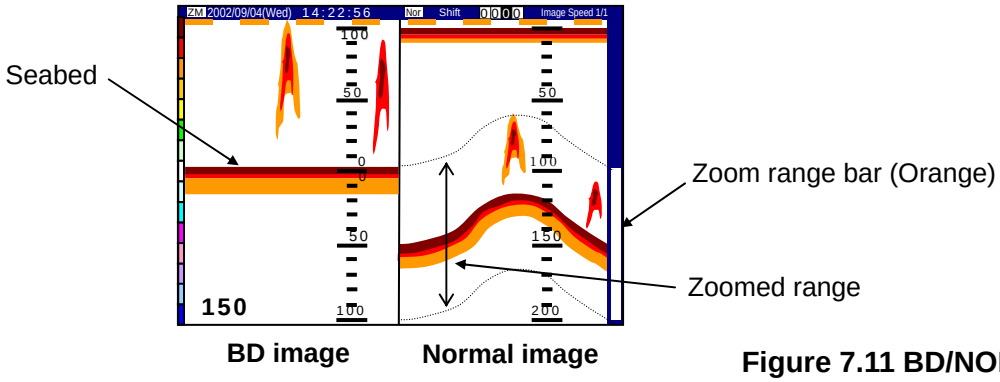


Figure 7.11 BD/NORM image

7.2.3.3 ZOOM/NORM image

This mode of image is a combination of normal and ZOOM (Referenced zoom) images. The ZOOM image shows a zoomed image of a certain depth range specified by the user, referenced to the depth set by the green VRM.

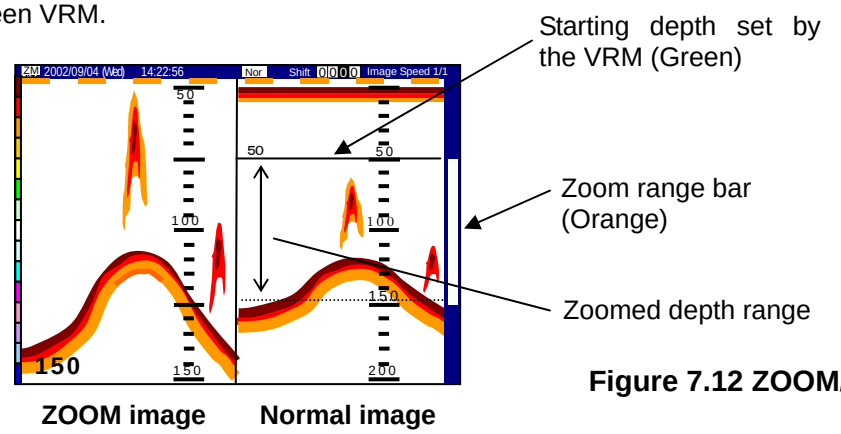


Figure 7.12 ZOOM/NORM image

7.2.3.4 B.Z. image

This mode of image is a single, partial zoomed sonar image, referenced to the seabed. Equally spaced depth markers are also displayed, which are referenced to the surface of the seabed.

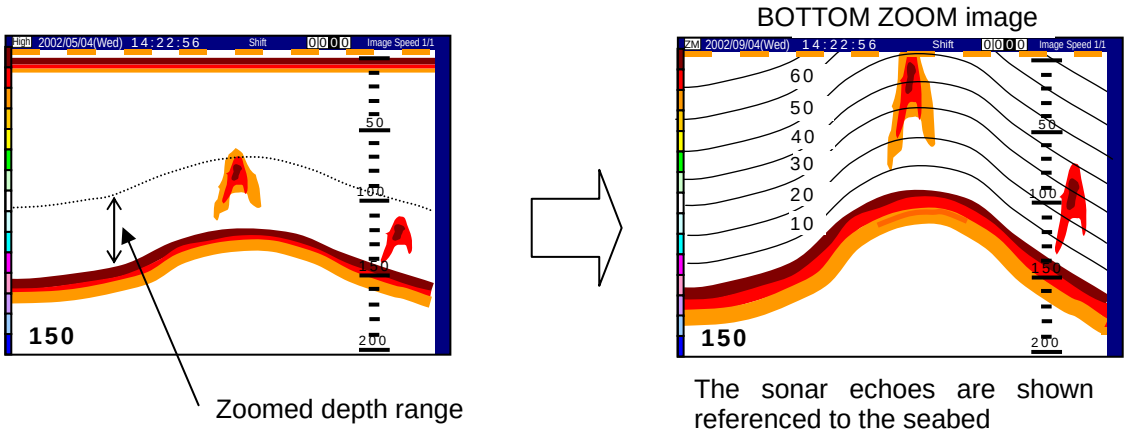


Figure 7.13 B.Z. image

7.3 Setting the Enhance effect

(1) Set the MODE switch to USER 1 position to show the USER 1 image.

(2) Press the menu key to show the MENU list.

(3) Press the up or down arrow key to highlight “Image” and press the right arrow key.

(4) Press the up or down arrow key to select Enhance. The Enhance sub menu is shown with the dynamic range of 25 dB.

(5) If you wish to change the setting, press the right arrow key and then press the up arrow key. You can choose 35, 45, 55, and 65 (dB) each time you press the key.

(6) Press the MENU key or the left arrow key three times to fix the setting and exit the menu.

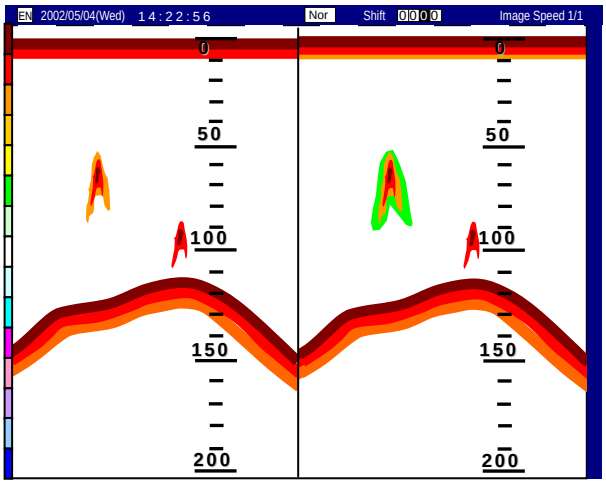


Figure 7.14 The effect of Enhancement

Main Menu => Image => Enhance

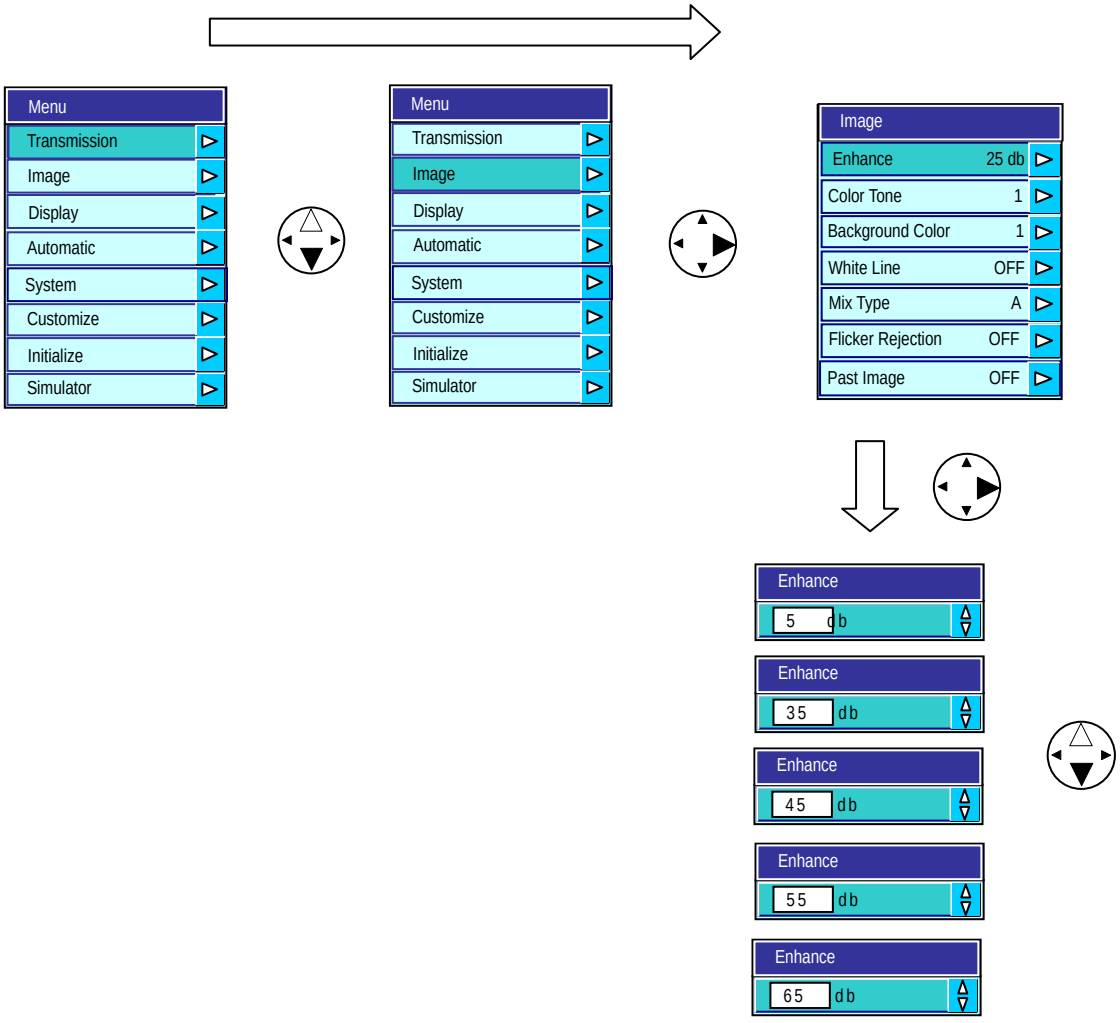


Figure 7.15 Setting the Enhancement effect

7.4 Setting the 3-Division Screen (H/L) and gain

(1) Set the MODE switch to USER 3.

(2) The gain adjustment for High Frequency 1 can be made with the H FREQ GAIN control.

(3) The gain adjustment for Low Frequency can be made with the L FREQ GAIN control.

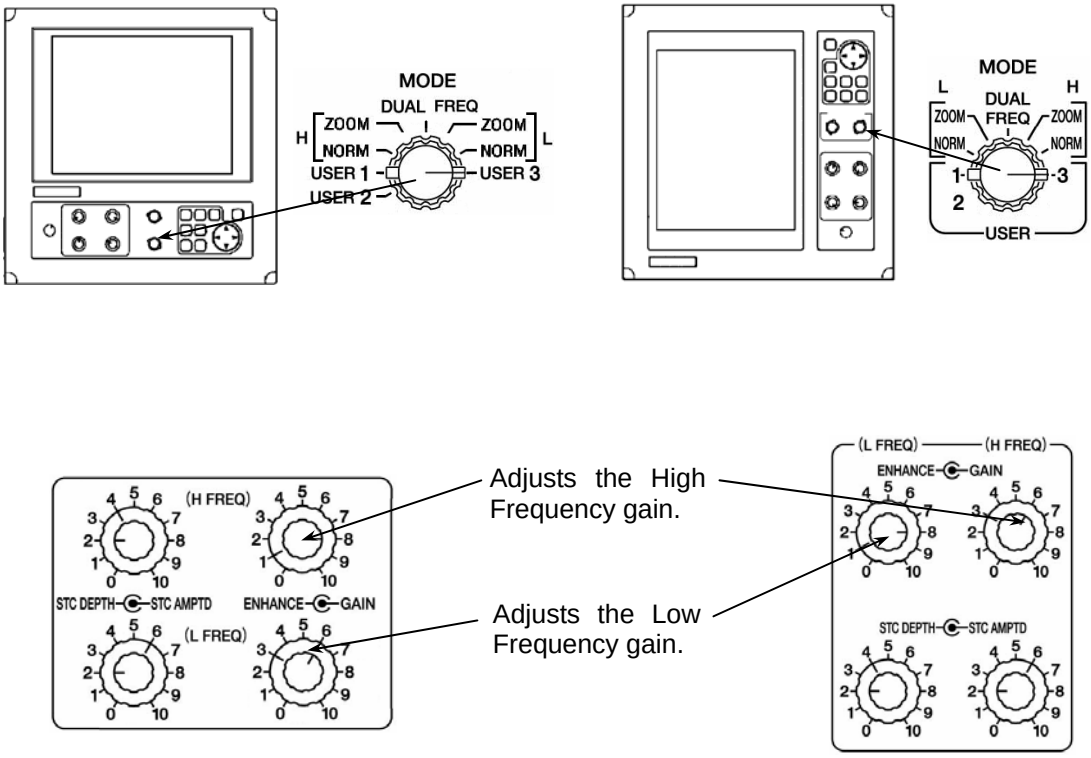
(4) The gain control for High Frequency 2 can be made only when the 3-Division Screen is selected.

(5) Press the up or low arrow key to display the gain control window.

(6) While this window is displayed, the gain control is effective. To increase the gain, press the up arrow key. To decrease the gain, press the down arrow key. The window will disappear 5 seconds after the last key operation has been done.

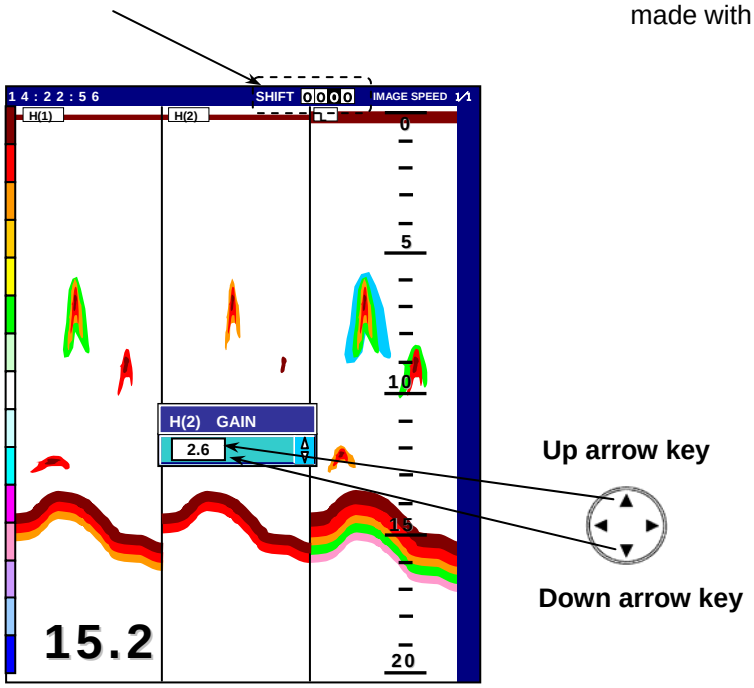
NOTE:

In the Shift mode, the up and down arrow keys are solely used for the image shift operation. To attempt adjusting gain control for High Frequency 2 image, exit the shift mode first, then carry out the operation.



The current setting is being set to Shift mode. Press the SHIFT key to turn this mode off.

The High Frequency 2 gain control can be made with up and down keys.



Continuous pressing of the up arrow key increases the gain with the gain index number increased in the window.
The same operation applies to the down arrow key for decreasing the gain.
The gain index number varies from 0.0 to 10.0 with 0.1 increment.

Chapter 8 Trouble Shooting

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Chapter 8 Trouble Shooting

This chapter covers simplified fault locating procedures to assist the ship's crew to locate a faulty module as well as simple fuse replacement.

8.1 Information required for service

Please advise the following details:

(1) Name of vessel, Satcom number if available.

(2) Equipment type name

(3) Equipment serial number

(4) Software type name, shown on the standby screen.

(5) Next port of call, ETA and ship's agent

(6) Faulty conditions and the result of on board check

8.2 Self check function

When the CVS-841/851 is first turned on, a system check program runs to diagnose system functions. If the result is found normal, the message "System check OK" will appear on the screen. If this sign does not appear, there is a possibility of system failure. Call for service.

8.3 Trouble shooting

The following table provides information about first line check schedules to locate a faulty area and gives remedial measure(s), where applicable.

Table 7.1 Fault finding chart for CVS-841/851

Faults detected	Possible cause of the failure	Remedial action against negative result
Equipment does not turn on	1. Is the fuse blown? 2. Does the power supply voltage lie within the rated range (10.8 – 31.2 VDC)? 3. Is the power cable firmly connected to ship's battery?	1. Replace the blown fuse with a new one. CAUTION: Make sure to turn off the main supply before attempting to replace the fuse. 2. Use a proper rated main supply. 3. Reconnect the cable firmly to the battery.
Equipment turns on with beep but nothing shown on the display.	1. LCD unit may be faulty. 2. Is the cable connection between the transducer and display unit firm and correct?	1. Call for service. 2. Check the cable for cut, short, etc. and repair the cable if necessary and reconnect.

(Fault finding chart for CVS-841/851)

Faults detected	**Possible cause of the failure**	**Remedial action against negative result**
No depth indication but XXXX shown.	1. Is the bottom echo displayed within the display? 2. If YES, then, is the bottom displayed in red?	1. Select an appropriate depth range in which the bottom is displayed. 2. Adjust the GAIN control to obtain the red sea bottom. If the above actions are not the answer, refer to Para 3.4 "Setting the video threshold" to obtain proper depth indication.
No water temperature display shown.	1. Is the water temperature unit (^{o}C or ^{o}F) selected? 2. Is the temperature/speed sensor type ST-80-1/90-1/100-1 connected to the receptacle J4 (TEMP) located at the rear panel? 3. Check if INT or EXT is properly selected for the temperature data input.	1. Select a desired temperature unit. 2. Connect an appropriate sensor type to CVS-841/851. 3. Select the suitable setting.
No present position is shown	1. Is the L/L or LOP coordinate selected in the Display/Present Position menu? 2. Is the necessary NMEA 0183 Nav data (GGA, GLL, GTD, RMC) supplied via the receptacle J5 (SER DATA) at the rear panel?	1. Select the suited coordinate. 2. Connect a Navigator unit that supplies NMEA 0183 format with suitable sentence (GGA, GLL, GTD, RMC).
No ship's speed data shown	1. Is the speed unit (kmh, mph, kt) selected in the Display/Boat Speed menu? 2. Is a proper speed sensor (ST-80-1/90-1/100-1) connected? 3. Is the necessary NMEA 0183 Nav data (VTG) supplied via the receptacle J5 at the rear panel?	1. Select a desired speed unit in the menu. 2. Connect a suitable speed sensor. 3. Connect a Navigator unit that supplies NMEA 0183 format with VTG sentence to J5.
No own ship's bearing display shown	1. Is the "Bearing ON" selected in the Initial Menu Display/Bearing? 2. Is the necessary NMEA 0183 Nav Data (VTG) supplied via the receptacle J2 (SER DATA) at the rear panel?	1. Select "Bearing ON" in the menu. 2. Connect a Navigator unit that supplies NMEA 0183 format with VTG sentence to J5.

8.4 Setting the video threshold

The bottom detection capability of the sounder may be affected by the transmitting power level, frequency, transducer type, and its mounting location in the hull. If you encounter unstable digital bottom depth indication on the display, please use the following procedure to obtain a correct and stable bottom depth indication.

NOTE: *The following settings should be done in your ordinary fishing ground.*

Setting procedure for the bottom detection threshold

(1) Activate the A-Scope display by the following order; Menu -> Display -> A Scope -> ON.

(2) Select the frequency by setting the image mode switch to NORM(H) or NORM(L).

(3) Select the Depth Measurement sub menu by; Menu -> System -> Depth Measurement -> High Frequency or Low Frequency.

NOTE: *When this sub menu is selected, the sonar image sensitivity may be reduced. You do not worry about this, because it is the processed video for the bottom detection.*

(4) To determine the best setting, use the following procedure.

a. Observe the A Scope in which a threshold graph is shown. The threshold level is being preset to –40 for both HIGH and LOW frequencies. Adjustable range is from –80 to 40.

b. Use the up and down key to allow the graph to touch the right end of the green bottom video. Read the threshold value at this time.

c. Again, press the down arrow key to reduce the value by 6. This setting is considered to be an optimum level that covers most likely case in the bottom detection. Adjust this value somewhat plus or minus according to the case, if required.

d. Too much reduced setting may cause a faulty bottom depth indication as a result of detecting schools of fish in a shallow depth as a bottom. Too much setting, on the other hand, causes no bottom depth indication with the XXXX display shown in the digital depth window.

e. The above setting can also be made without showing the A Scope. When the XXXX display is shown, simply reduce the threshold until the bottom depth value is stably shown. Then, further reduce the threshold value by 6. This sets an optimized detection threshold.

f. Press the MENU key to fix the setting. Repeat the same procedure from step 2 for other frequency (LOW).

g. Press the MENU key 3 times to return to normal sounder display.

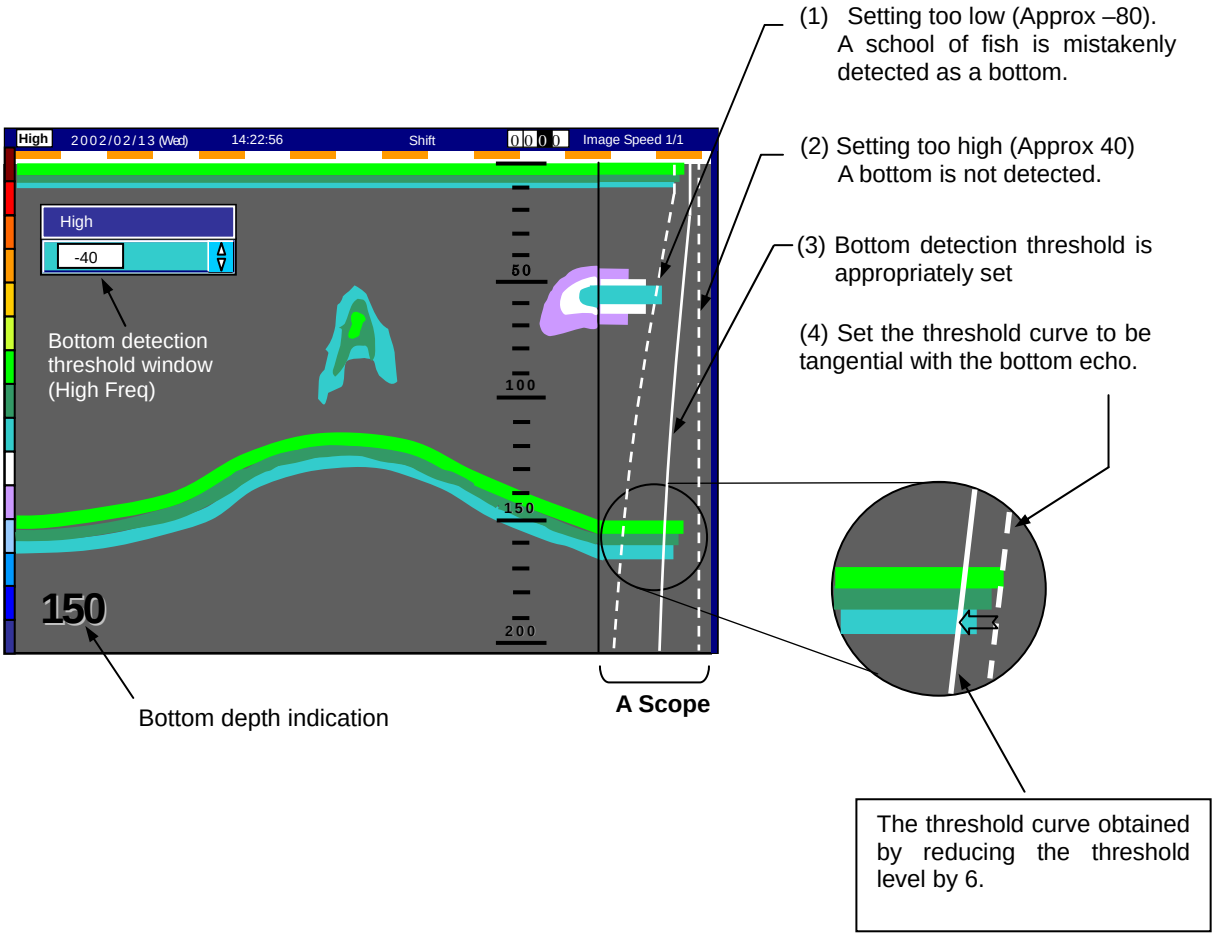

Figure 8.1 Setting the bottom detection threshold

Chapter 9 Maintenance

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Chapter 9 Maintenance

9.1 Periodic inspection and cleaning

To prolong the equipment life, the following maintenance should be performed on a routine basis. Also, from time to time, check plug connections and cables.

9.1.1 Monthly check

If the display screen is dirty, clean the screen with a soft cloth damped with anti-static agent or pure water. Do not use a dry cloth as it causes static build up, which accumulates dust.

9.1.2 Yearly check

Inspect the surface of the transducer for any marine growth. If so, remove the growth using an appropriate tool taking care not to scratch the surface. Harsh scratching of the transducer surface may cause the transducer performance to be severely degraded.

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10.5 Data input serial line 10-5

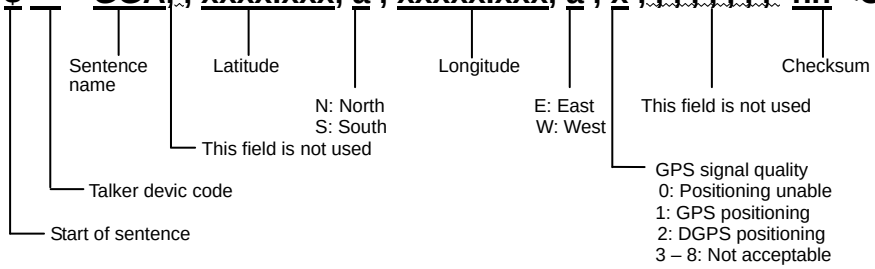
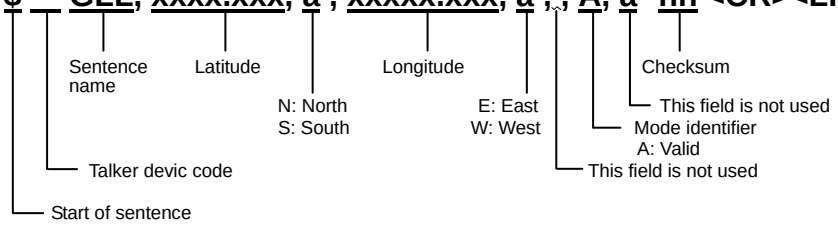
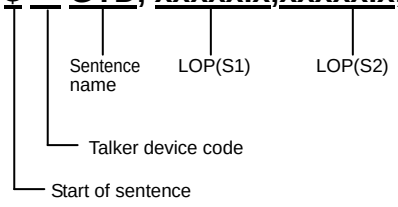
Chapter 10 Technical References

10.1 Serial input data

Data format: NMEA-0183 Ver. 1.5 and 2.0

10.2 Details of input sentences

NOTE: *Checksum is a total sum of EX-ORed data that are put between the $ and asterisk (*) signs.*

Name & Version	Data name
GGA Ver. 1.5/2.0	GPS Position data **$ - - GGA,, xxxx.xxx, a , xxxxx.xxx, a , x ,,,,,,,,,,,,,,,*hh <CR><LF>** 
GLL Ver. 1.5/2.0	Geographic position **$ - - GLL, xxxx.xxx, a , xxxxx.xxx, a ,, A, a *hh <CR><LF>** 
GTD Ver.1.5	Geographical position,Loran-C **$ - - GTD, xxxxx.x,xxxxx.x,,,,<CR><LF>** 

Name & Version	Data name
MTW Ver.1.5	Water temperature **$ - - MTW, xx.x, C *hh <CR><LF>** Sentence name Checksum Temperature(^{O}C) Talker device code Start of sentence
RMC Ver. 1.5/2.0	Recommended minimum specific GPS data $ - - RMC, hhmmss, A, xxxx.xxx, N/S, xxxx.xxx, E/W, xxx.x, xxx.x, xxxxxx, *hh <CR><LF> Sentence type Latitude Longitude Course over ground, degree true This field is not used Talker device A: Data valid V:Data invalid N: North S: South E: East W: West Date: dd/mm/yy Start of sentence UTC of position fix (hr/min/sec) Speed over ground, knots
VTG Ver.1.5	Course and water speed **$ - - VTG, xxx.x, T, , , xx.x, N, , ,a *hh <CR><LF>** Sentence Name Ship's bearing (True) Ground speed (KNT) Checksum Mode identifier These fields are not used Talker device code Start of sentence

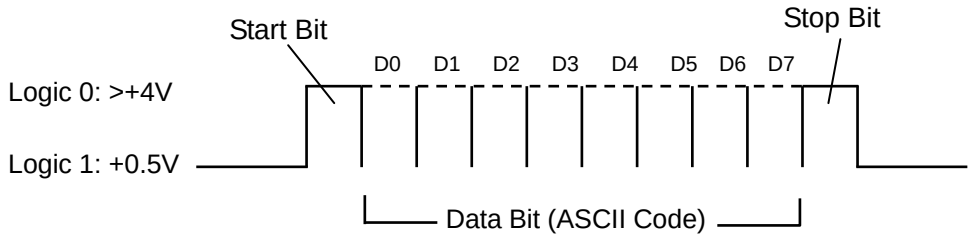
10.3 Serial output data

Data format: NMEA-0183 Ver. 1.5 and 2.0

10.3.1 Details of output data sentences

NOTE: *Checksum is a total sum of EX-ORed data that are put between the $ and asterisk (*) signs.*

Data structure



NOTE: A parity bit is not provided.

10.3.2 Output signal specification

Data rate: 4800 baud

Output signal level: TTL

Output current: 5 mA Maximum

Data refreshing rate: 1 second

Name & Version	Sentence name
DBS	Depth data (From the sea surface to the seabed)
Ver.1.5	**$ SD DBS, xxxx.x, f, xxxx.x, M, xxx.x, F *hh <CR><LF>** $: Start of sentence SD: Talker device code DBS: Sentence name xxxx.x: Depth (feet) f: Depth (feet) xxxx.x: Depth (meters) M: Depth (meters) xxx.x: Depth (fathom) F: Depth (fathom) hh: Checksum

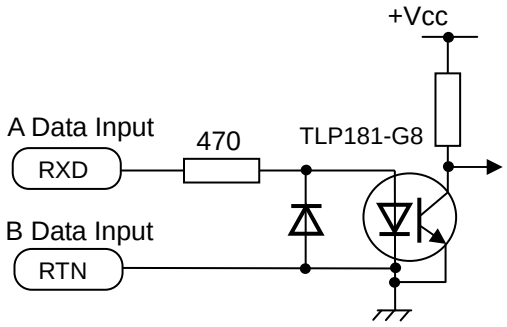
Name & Version	Sentence name
DBT	Depth (From the transducer surface to the seabed)
Ver.1.5	**$ SD DBT, xxxx.x, f, xxxx.x, M, xxx.x, F *hh <CR><LF>** Sentence name Depth (feet) Depth (meters) Depth (fathom) Checksum Talker device code Start of sentence
DPT	Depth (From the transducer surface to the ocean down below)
Ver.2.0	**$ SD DPT, xxxx.x, xxxx.x, *hh <CR><LF>** Sentence name Depth (m) Draft level (m) Checksum Talker device code Start of sentence
MTW	Water temperature
Ver.1.5	**$ SD MTW, xx.x, C *hh <CR><LF>** Sentence name Temperature(^{o}C) Checksum Talker device code Start of sentence
TLL	Target latitude and longitude
Ver.2.0	**$ SD TLL, xx, xxxx.xxx, a, xxxxx.xxx, a, , ,hhmmss.ss, a, a *hh <CR><LF>** Sentence name Latitude Longitude UTC data Checksum N: North S: South E: East W: West Reference target fixed to “T” Target number fixed to 00 Target number (Not assigned) Target status fixed to “0” Talker device code Start of sentence NOTE: This sentence is output only when the EVENT key is pressed.

10.4 Data input/output serial line

Port name: J2

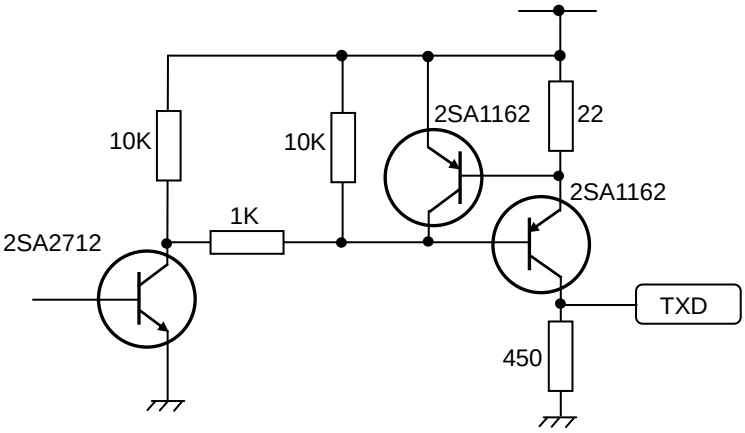
The connector used: Type LTWD-06BFFA-L180

Serial Data input (listener side):
The IEC 61162-1 standard signal can be received.
Input load: 470 ohms
Device: Opto-coupler
Type TLP181-G8 (Toshiba)



Serial data input circuit

Serial Data output (talker side):
The IEC 61162-1 standard signal can be transmitted.
Device: RS232C Driver IC
Type 2SA1162



Serial data output circuit

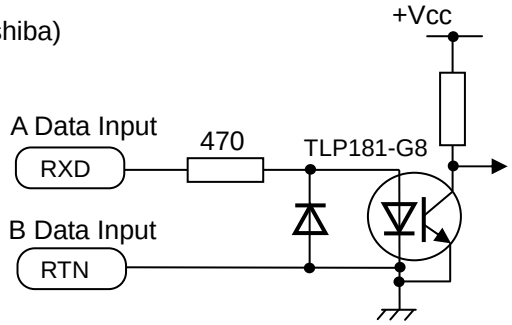
10.5 Data input serial line

Port name: J5

The connector used: Type LTWD-06BFFA-L180

Serial Data input (listener side):

The IEC 61162-1 standard signal can be received.
Input load: 470 ohms
Device: Opto-coupler type TLP181-G8 (Toshiba)



Serial data input circuit

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A1. User settings list

Menu		User 1	User 2	User 3	User 4
Transmission	Pulse Width (H)				
	Pulse Width (L)				
	Output				
	PRR				
Image	Enhance				
	Color Tone				
	Background Color				
	White Line				
	Mix Type				
	Flicker Rejection				
	Past Image				
Display (Note1) The Information window feature is not available in CVS-841.	A Scope				
	Information Window (Note1)				
	Zoom Type				
	Zoom Range				
	User 1				
	User 2				
	User 3				
	Depth Value				
	Depth Value Position				
	Scale				
	Scale Position				
	Scale Value				
	Time Mark				
	Image Direction				
	Image Partition				
	Image Swap				
	Color Bar Scale				
	Present Position				
	Boat Speed				
	Bearing				
	Water Temp				
	Water Temp Graph				
	Event Position				
	Event Distance				
	Event Direction				
	Event Elapsed Time				
Automatic	Auto Range				
	Auto Shift				
System (Note2) CVS-841 has no Year, Month, Day, a Day of the Week displays.	Time(Note2)				
	Depth Unit				
	Depth Range Preset				
	Draft Setting				
	Bottom Start				
	Bottom Detection				
	Bottom Detection Adjust				

Menu		User 1	User 2	User 3	User 4
System	Depth Measurement				
	Sonic Correction				
	Boat Speed Correction				
	Water Temp Correction				
	Speed Data				
	Water Temp Data				
	EXT Trigger Type				
	Language				
Customize	GAIN Property				
	STC Property				
	Color Customize				
	Palette No.(Palette Color)				
	Red				
	Green				
	Blue				
	Panel Lock				
	H FREQ GAIN control				
	H FREQ ENHANCE Control				
	H FREQ STC DEPTH Control				
	H FREQ STC AMPTD Control				
	L FREQ GAIN Control				
	L FREQ ENHANCE Control				
	L FREQ DEPTH Control				
	L FREQ STC AMPTD Control				
	RANGE switch				
	MODE switch				
	VRM key				
	IMAGE SPEED key				
	IR key				
	SHIFT key				
	COLOR REJECT key				
	ALARM key				
	Event KEY				

Note: In case the palette number (palette color) column is not sufficient, record the entries in a separate paper.

A2. Factory default list

A2.1 Dedicated key functions

		Factory Default 1	Factory Default 2	Factory Default 3	Factory Default 4
SHIFT		0	0	0	0
VRM (VRM 1)		0	0	0	0
VRM (VRM2)		0	0	0	0
IMAGE SPEED		1/1	1/1	1/1	1/1
COLOR REJECTION		No	No	No	No
IR		2	2	2	2
ALARM (DEPTH)		OFF	OFF	OFF	OFF
ALARM (FISH)		OFF	OFF	OFF	OFF
EVENT		OFF	OFF	OFF	OFF

A2.2 Menu functions

		Factory Default 1	Factory Default 2	Factory Default 3	Factory Default 4
Transmission	Pulse Width (H)	Short	Short	Short	Short
	Pulse Width(L)	Short	Short	Short	Short
	Output	Normal	Normal	Normal	Normal
	PRR	1	1	1	1
Image	Enhance	25	25	25	25
	Color Tone	1	1	1	1
	Background Color	1	1	1	1
	White line	OFF	OFF	OFF	OFF
	Mix Type	C	C	C	C
	Flicker Rejection	ON	ON	ON	ON
	Past Image	ON	ON	ON	ON
Display (**Note1**) The Information window feature is not available in CVS-841.	A Scope	OFF	OFF	ON	ON
	Information Window (Note1)	OFF	OFF	OFF	OFF
	Zoom Type	BTM	BTM	BTM	BTM
	Zoom Range	5	5	5	50
	User 1	BTM	BTM	BTM	BTM
	User 2	D.B	D.B	D.B	D.B
	User 3	H(1)/H(2)/L	H(1)/H(2)/L	H(1)/H(2)/L	H(1)/H(2)/L
	Depth Value	Large	Large	Large	Large
	Depth Value Position	Bottom	Bottom	Bottom	Bottom
	Scale	Single	All	Single	All
	Scale Position	Side	Side	Side	Side
	Scale Value	Small	Small	Small	Small
	Time Mark	10 sec	10 sec	10 sec	10 sec
	Image Direction	←|←|	←|←|	←|←|	←|←|
	Image Partition				
	Image Swap	A|B	A|B	A|B	A|B

(Menu function default values)

		Factory Default 1	Factory Default 2	Factory Default 3	Factory Default 4
Display	Color Bar Scale	ON	ON	ON	ON
	Present Position	OFF	OFF	OFF	OFF
	Boat Speed	OFF	OFF	OFF	OFF
	Bearing	OFF	OFF	OFF	OFF
	Water Temp	OFF	OFF	OFF	OFF
	Water Temp Graph	OFF	OFF	OFF	OFF
	Event Position	OFF	OFF	OFF	OFF
	Event Distance	OFF	OFF	OFF	OFF
	Event Direction	OFF	OFF	OFF	OFF
	Event Elapsed Time	OFF	OFF	OFF	OFF
Automatic	Auto Range	OFF	OFF	OFF	OFF
	Auto Shift	OFF	OFF	OFF	OFF
System (Note2) CVS-841 has no Year, Month, Day, a Day of the Week displays.	Time(Note2)	2001/01/01	2001/01/01	2001/01/01	2001/01/01
		00:00:00	00:00:00	00:00:00	00:00:00
	Depth Unit	m	J.fm	m	ft
	Depth Range Preset	Refer to A2.2.3 “Depth Range Preset default values for default values”.			
	Draft Setting	0.0	0.0	0.0	0.0
	Bottom Start	5.0	3.0	5.0	17.0
	Bottom Detection	Inside Range	Inside Range	Inside Range	Inside Range
	Depth Detection Adjust	H:-40 L:-40	H:-40 L:-40	H:-40 L:-40	H:-40 L:-40
	Depth Measurement	Auto	Auto	Auto	Auto
	Sonic Correction	0%	0%	0%	0%
	Water Temp Correction	0.0	0.0	0.0	0.0
	Boat Speed Correction	0.0	0.0	0.0	0.0
	Speed Data	EXT	EXT	EXT	EXT
	Water Temp Data	EXT	EXT	EXT	EXT
	EXT Trigger Type	OFF	OFF	OFF	OFF
	Language	Fixed to English language.			
Customize	Gain Peoperty	8800 type	8800 type	8800 type	8800 type
	STC Property	Standard	Standard	Standard	Standard
	Color Customize				
	Panel Lock	All OFF	All OFF	All OFF	All OFF
	Panel Brightness	5/5	5/5	5/5	5/5
Simulator		OFF	OFF	OFF	OFF

A2.3 Depth range preset default values

Depth Range Preset		Factory Default 1(m)	Factory Default (J.fm)	Factory Default 3(m)	Factory Default 4(ft)
1kW	1	20	10	20	60
	2	50	30	50	160
	3	80	50	80	260
	4	100	65	100	320
	5	200	130	200	640
	6	500	330	500	1600
	7	1000	650	1000	3200
	8	1200	1000	1200	4000
3kW/5kW	1	20	10	20	60
	2	50	30	50	160
	3	80	50	80	260
	4	100	65	100	320
	5	200	130	200	640
	6	500	330	500	1600
	7	1000	650	1000	3200
	8	1500	1000	1500	5000

KODEN

Koden Electronics Co., Ltd.

Tamagawa Office:
2-13-24 Tamagawa, Ota-ku, Tokyo, 146-0095 Japan
Tel: +81-3-3756-6501 Fax: +81-3-3756-6509
Uenohara Office:
5278 Uenohara, Uenohara-shi, Yamanashi, 409-0112 Japan
Tel: +81-554-20-5860 Fax: +81-554-20-5875

www.koden-electronics.co.jp

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